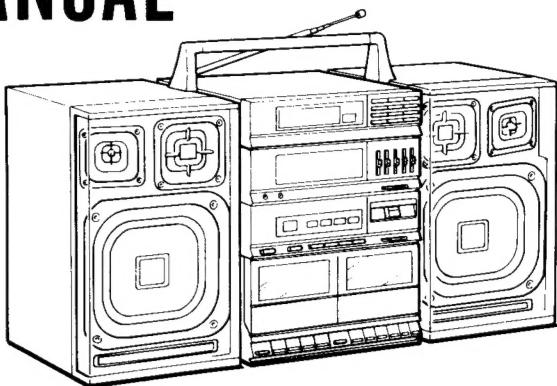


FH-209W

SERVICE MANUAL

*US Model
Canadian Model
AEP Model
UK Model*



'Dolby' and the double-D symbol are the trade marks of Dolby laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

- FH-209W consists of ST-209, DXA-209W, and APM-209.

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— Continued on page 2 —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

**COMPACT HI-DENSITY
COMPONENT SYSTEM
SONY®**



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FEATURES**Tuner section**

- **Preset function** stores a total of 20 stations.
- **Preset-station-scanning function** helps you search for a desired program.

Amplifier section

- **A 5-band graphic equalizer** with a spectrum analyzer for fine adjustment of tone quality for both recording and playback.
- **DOL (Dynamic Optimum Loudness)** for obtaining sufficient bass sounds.

Cassette deck

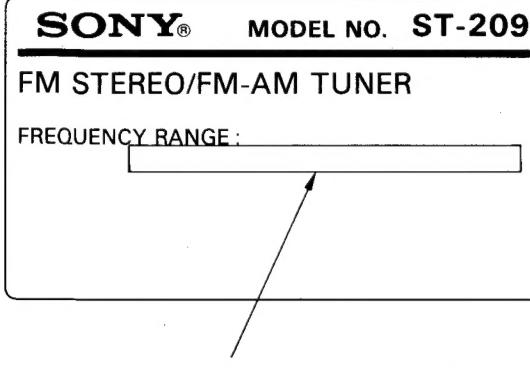
- **Relay play** for playing both decks successively.
- **Two synchro dubbing speeds** available.

MODEL IDENTIFICATION

— Specification Label —

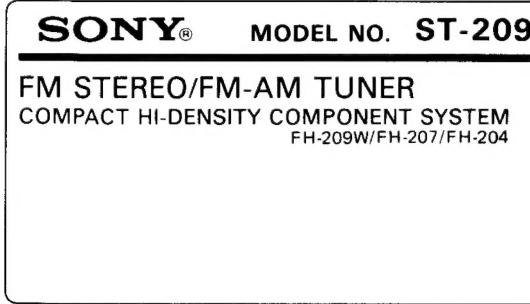
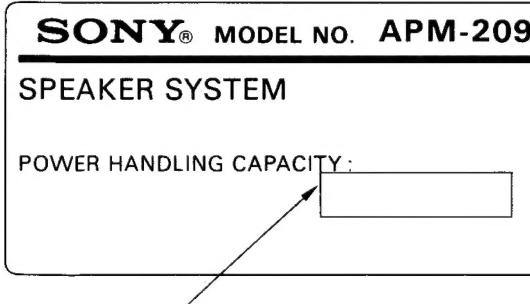
ST-209

US, Canadian, AEP, UK model

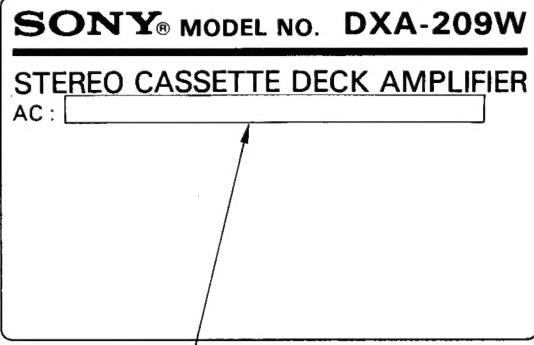


{ FM: 87.5–108 MHz AM: 530–1610 kHz . . . US, Canadian model
 { FM: 87.5–108 MHz MW: 522–1611 Hz
 LW: 144–288 kHz . . . AEP, UK model

G-AEP model

**APM-209**

{ 35 W (NOM), 70 W (MAX) . . . US, Canadian model
 { MUSIC 70 W (DIN) AEP, UK model

DXA-209W

120 V ~ 60 Hz 100W US, Canadian model
 220 V ~ 50/60 Hz 75W AEP model
 240 V ~ 50 Hz 160W UK model

- This label is stucked on DXA-209W (For G-AEP model).



SPECIFICATIONS

ST-209 tuner

System	FM stereo, FM/AM superheterodyne tuner Quartz-locked PLL digital synthesizer system
FM tuner section	
Tuning range	87.5 – 108 MHz
Antenna	Telescopic antenna
Antenna terminals	75 Ohms unbalanced
Intermediate frequency	10.7 MHz
Usable sensitivity	2.3 μ V (S/N = 30 dB/75 ohms)
Signal-to-noise ratio	78 dB (mono), 70 dB (stereo)
Harmonic distortion at 1 kHz	0.2% (mono), 0.5% (stereo)
Separation at 1 kHz	40 dB
Selectivity at 400 kHz	55 dB

MW/LW tuner section (for AEP/UK model)

	MW	LW
Tuning range	522 – 1,611 kHz	144 – 288 kHz
Antenna	Built-in ferrite bar antenna External antenna terminal	
Intermediate frequency		
Usable sensitivity	Built-in ferrite bar antenna 250 μ V/m (999 kHz)	500 μ V/m (230 kHz)
	External antenna 100 μ V (999 kHz)	150 μ V (230 kHz)
Signal-to-noise ratio	52 dB (50 mV/m)	
Harmonic distortion	0.3% (50 mV/m, 400 Hz)	

AM tuner section (for US/Canadian model)

	AM
Tuning range	530 – 1,610 kHz (at 10 kHz step)
Antenna	Built-in ferrite bar antenna External antenna terminal
Intermediate frequency	
Usable sensitivity	Built-in ferrite bar antenna 250 μ V/m (1,000 kHz)
	External antenna 100 μ V (1,000 kHz)
Signal-to-noise ratio	52 dB (50 mV/m)
Harmonic distortion	0.3% (50 mV/m, 400 Hz)

General

Dimensions	Approx. 215 x 55 x 240 mm (w/h/d) (8 $\frac{1}{2}$ x 2 $\frac{1}{4}$ x 9 $\frac{1}{2}$ inches) incl. projecting parts and controls.
Weight	Approx. 0.9 kg (2 lb) net

DXA-209W cassette deck amplifier

Cassette deck section

Recording system	4-track 2-channel stereo
Frequency response	
	DOLBY NR OFF (DIN)
TYPE II cassette (Sony UCX)	60 – 14,000 Hz (\pm 3 dB)
TYPE I cassette (Sony HF-S)	
	60 – 13,000 Hz (\pm 3 dB)
Wow and flutter	
	0.1% WRMS \pm 0.3% (DIN)

Amplifier

Continuous RMS power output	35 W +35 W (6 ohms, at 1 kHz, 5% THD)
	25 W +25 W (6 ohms, 40 Hz – 20 kHz, 1% THD)

Music power output

120 W (6 ohms)
DC operation with the optional EBP-87

1 W +1 W (6 ohms, at 1 kHz, 5% THD)

Inputs

	Sensitivity	Impedance
PHONO (phono jacks)	2.5 mV	50 kilohms
CD/AUX (phono jacks)	450 mV	50 kilohms
MIC (minijack)	1 mV	600 ohms

Outputs

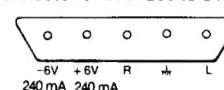
PHONES (stereo minijack)	Accepts headphones of 8 ohms or more
SPEAKER	Accepts speakers of 6 to 16 ohms

Frequency response

PHONO: RIAA curve \pm 0.5 dB
CD/AUX: 40 Hz – 30 kHz \pm 3 dB
MIC: 100 Hz – 10 kHz \pm 3 dB

Dimensions Approx. 215 x 235 x 250 mm (w/h/d)
(8 $\frac{1}{2}$ x 9 $\frac{1}{8}$ x 9 $\frac{1}{2}$ inches)

Weight incl. projecting parts and controls
Approx. 5.0 kg (11 lb 1 oz) net
5-pin DC output connector of DXA-209 to ST-209



APM-209 speaker (for US/Canadian/AEP model)

Speaker system	3 way speaker system
Speaker units	Woofer: 134 cm ² APM type Tweeter: 5 cm dia. cone type Super tweeter: 3.5 cm dia. ceramic type
Enclosure type	Bass reflex
Frequency range	60 Hz – 20 kHz
Sensitivity	88 dB/W/m
Impedance	6 ohms
Dimensions	Approx. 175 x 290 x 220 mm (7 x 11 $\frac{1}{2}$ x 8 $\frac{3}{4}$ inches)
Weight	Approx. 3.2 kg (7 lb 1 oz)

General

Power requirements

US, Canadian model: 120 V AC, 60 Hz
UK model: 240 V AC, 50 Hz
AEP model: 220 V AC, 50/60 Hz

Power consumption

US, Canadian model: 100 watts
UK model: 160 watts
AEP model: 75 watts
Dimensions Approx. 585 x 355 x 250 mm (w/h/d)
(23 $\frac{1}{8}$ x 14 x 9 $\frac{1}{2}$ inches)
incl. projecting parts and controls

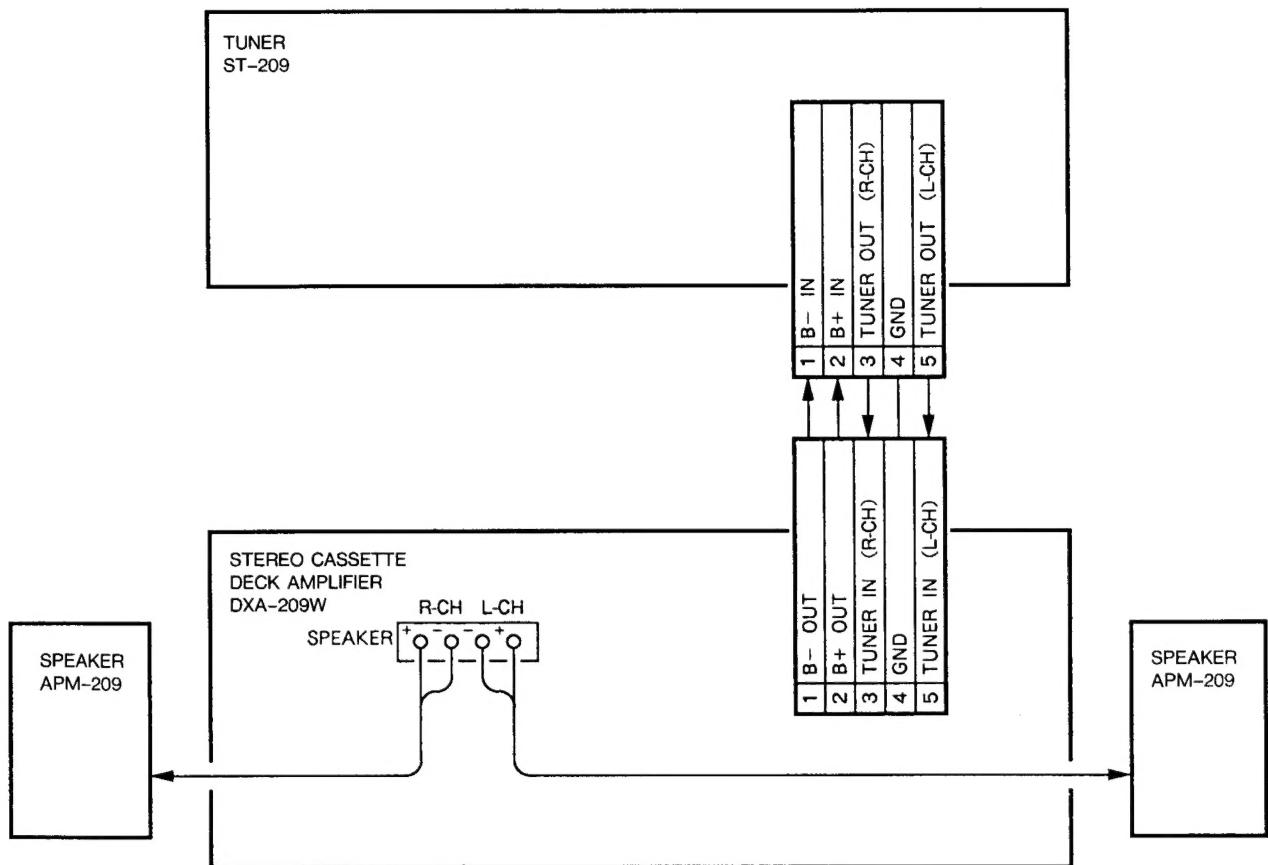
Weight

US/Canadian/AEP model:

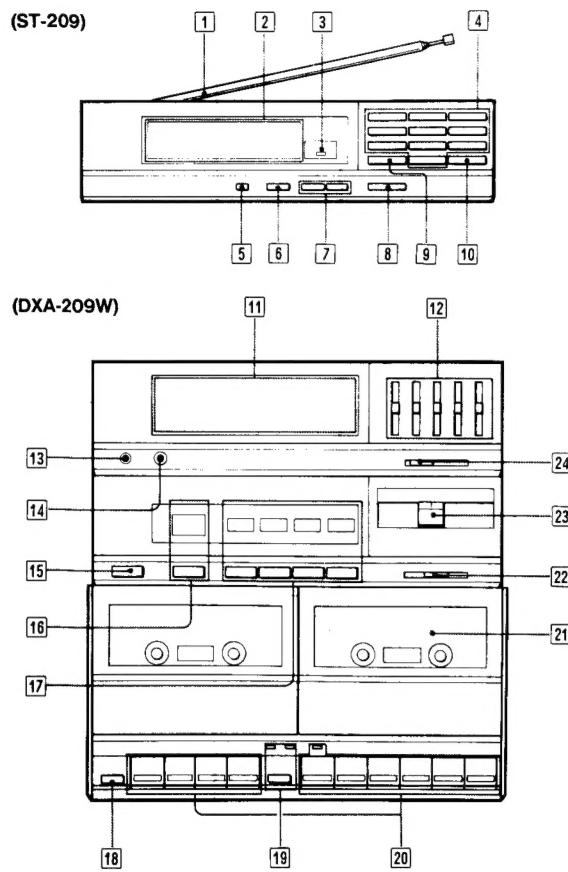
net	in shipping carton
Approx. 13.0 kg (28 lb 11 oz)	Approx. 14.8 kg (32 lb 11 oz)

UK model:

net	in shipping carton
Approx. 6.6 kg (14 lb 9 oz)	Approx. 8.6 kg (19 lb 0 oz)

CONNECTOR'S SIGNAL ASSIGNMENT

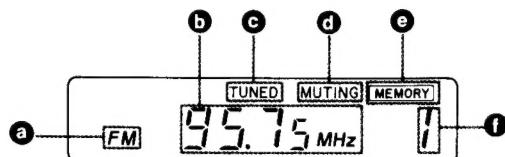
FUNCTION OF CONTROLS



TUNER

1 Telescopic antenna

2 Display window



a BAND indicator

b FREQUENCY indicator

c TUNED indicator

Appears when a signal is tuned in.

d MUTING indicator

Appears when the STEREO/MUTING switch is pressed.

e MEMORY indicator

Appears when the MEMORY button is pressed.

f PRESET (preset channel) indicator

3 STEREO indicator

4 PRESET (10-Key station preset) selectors

Used for quick tuning of frequently used radio stations.

5 STEREO/MUTING switch

Normally keep this switch engaged to eliminate FM interstation noise while tuning from station to station. (The MUTING indication appears.)

Press to disengage when listening to the noisy FM stereo program. There is no stereo effect, but the reception will be improved.

6 BAND selector

Each time it is pressed, the band changes in the following sequence.

AEP/UK model: FM → MW → LW

Canadian model: FM → AM

7 TUNING + and - buttons

Use to change radio stations.

8 MEMORY SCAN button

Press to scan the preset stations.

9 MEMORY button

10 ENTER button

Completes preset station selections.

CASSETTE DECK AMPLIFIER

11 SPECTRUM ANALYZER display

Visually display output by frequency band. Use to help make equalizer adjustments.

12 GRAPHIC EQUALIZER controls

Allows sophisticated tone control.

13 PHONES (headphones) jack (stereo minijack)

14 MIC (microphone) jack (minijack)

15 POWER switch

16 DOL (Dynamic Optimum Loudness) button and indicator

Reinforces bass sound in listening. To disengage the button, press it again.

17 FUNCTION select buttons and indicators

TAPE: Press to listen to tapes.

CD: Press to listen to or to record from compact discs or auxiliary sources.

TUNER: Press to listen to or record radio programs.

PHONO: Press to listen to or to record from phonograph records.

18 DOLBY NR* switch

19 DUBBING SPEED select button and indicators

20 Tape operation buttons

▶ PLAY (playback)

◀ REW (rewind)

▶ FF (fast forward)

■ STOP/EJECT

● REC (record)

■ PAUSE

21 Cassette holder

22 BALANCE control

Changes relative strength of right and left speaker output. Use to correct stereo imaging, especially when the speaker position is not symmetrical.

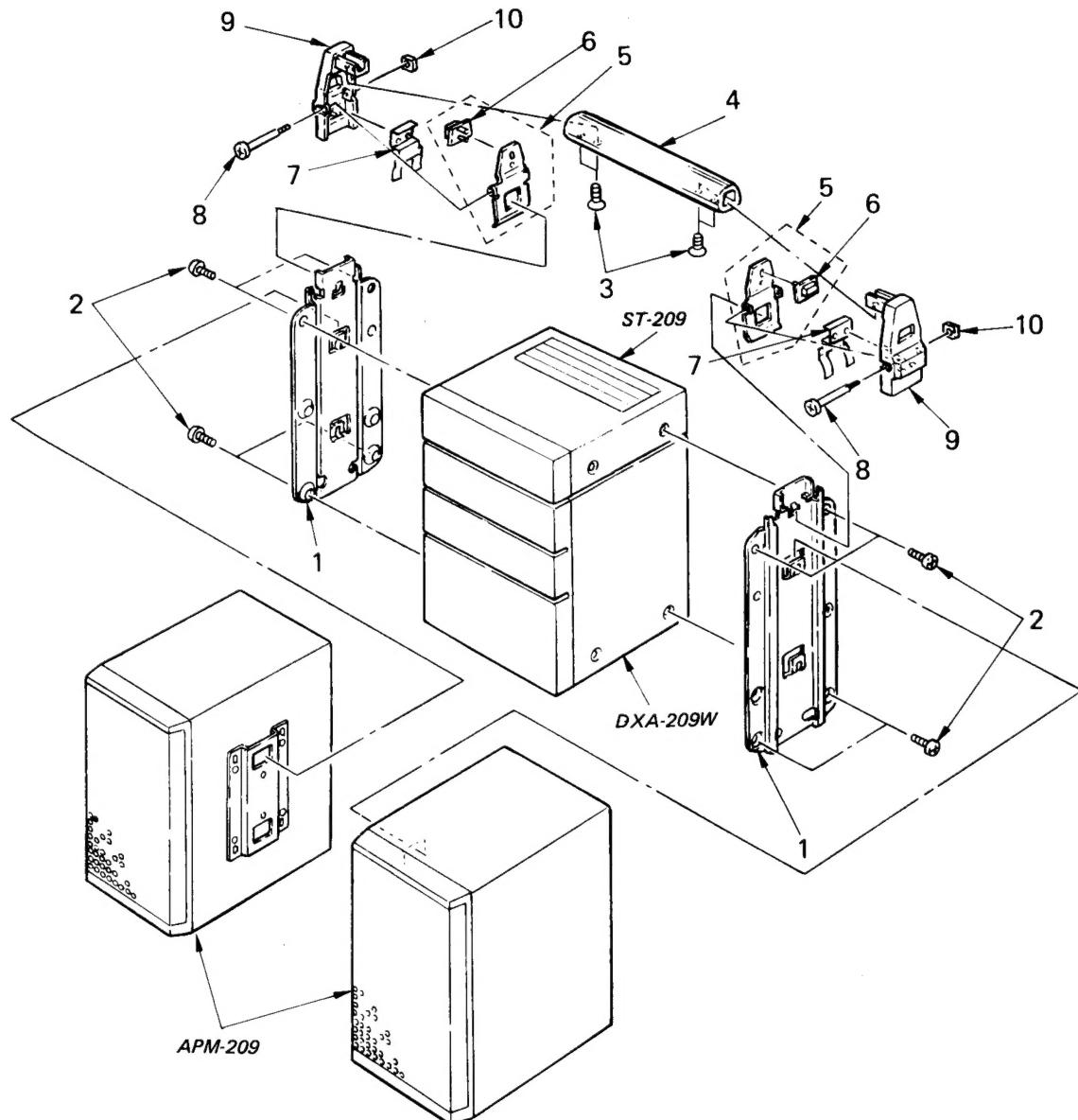
23 VOLUME control

24 MIC LEVEL (microphone level) control

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol  are trade marks of Dolby Laboratories Licensing Corporation.

EXPLODED VIEW AND PARTS LIST



No.	Part No.	Description	Remarks
1	4-920-120-01	PLATE (A), SIDE	
2	X-4910-086-1	SCREW ASSY, SIDE PLATE	
3	7-685-247-19	SCREW +KTP 3X10 TYPE2 SLIT	
4	2-249-402-21	HANDLE	
5	X-4919-631-1	PLATE ASSY, SEESAW	6
6	4-884-803-12	PUSH BUTTON	
7	4-902-942-03	SPRING, LEAF	
8	4-884-805-21	SHAFT	
9	4-910-361-11	HOLDER, HANDLE	
10	4-884-801-11	NUT, PLATE	

DXA-209W PACKING MATERIAL

4-919-627-01 CUSHION, LOWER
 4-919-628-01 CUSHION, LOWER
 4-920-151-01 SHEET, PROTECTION

ST-209 PACKING MATERIAL

4-884-884-00 SHEET, PROTECTION

APM-209 PACKING MATERIAL

4-920-121-01 CUSHION
 4-920-151-01 SHEET, PROTECTION

ACCESSORY & PACKING MATERIAL

3-701-613-00 BAG, POLYETHYLENE
 3-701-630-00 BAG, POLYETHYLENE
 3-703-390-01 (US).....INSTRUCTION
 3-769-005-11 (AEP,UK,Canadian)....MANUAL, INSTRUCTION
 3-769-005-41 (AEP,G-AEP).....MANUAL, INSTRUCTION
 3-769-005-21 (US).....MANUAL, INSTRUCTION
 4-919-619-01 (UK)....INDIVIDUAL CARTON
 4-919-620-01 (AEP,G-AEP,Canadian,US)....INDIVIDUAL CARTON
 9-911-842-XX CUSHION (F)

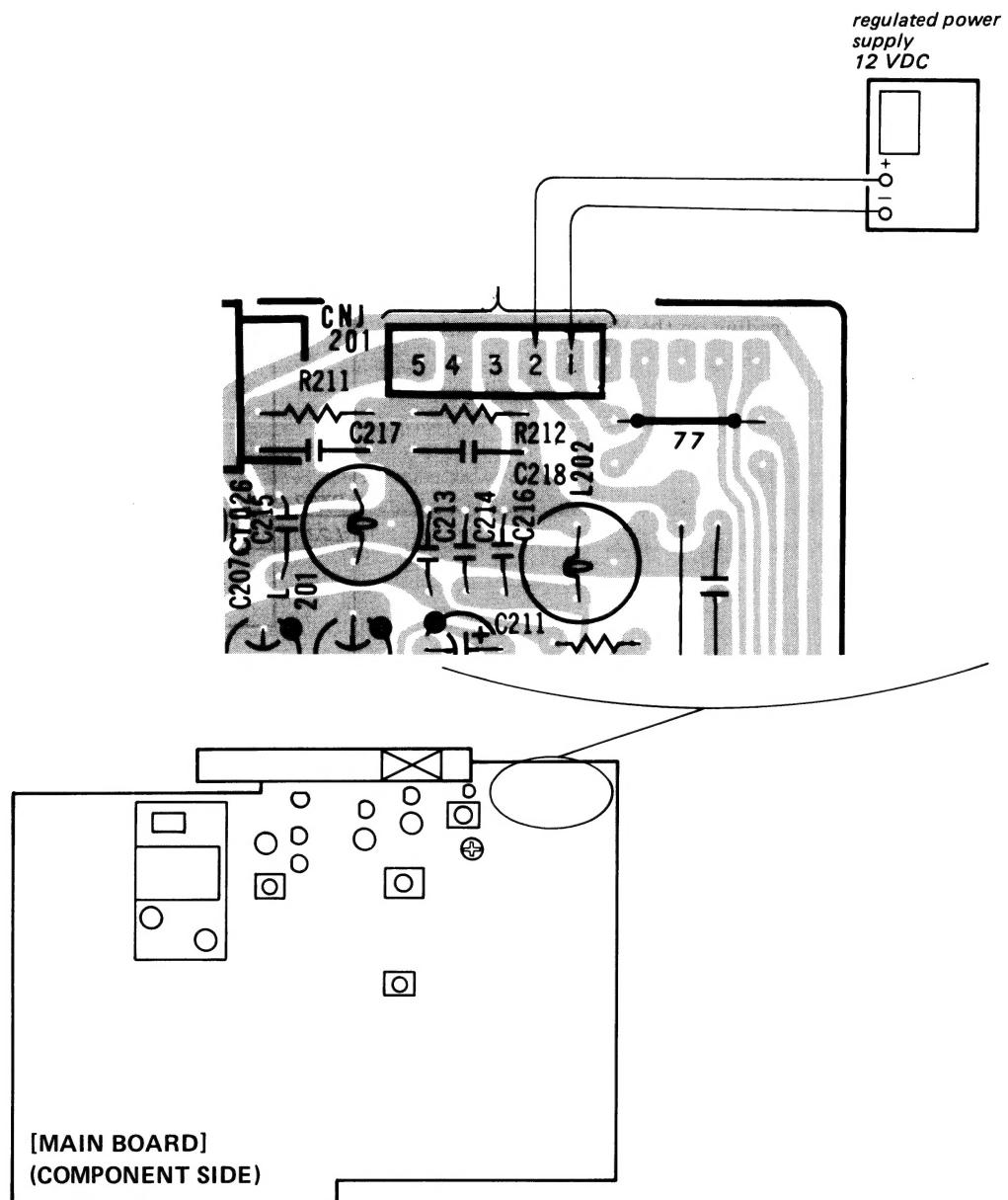
FH-209W

FH-209W
FH-204FM STEREO/FM-AM TUNER
〔ST-209〕US Model
Canadian Model

REPAIRING PRECAUTION

[To apply B+ voltage]

The power of this unit is fed from other unit.
 When the unit operates individually, connect the regulated power supply to the point as shown in the below fig.



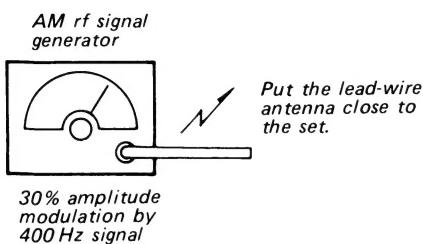
SECTION 1

ELECTRICAL ADJUSTMENTS

AM SECTION

Setting:

BAND selector switch: AM



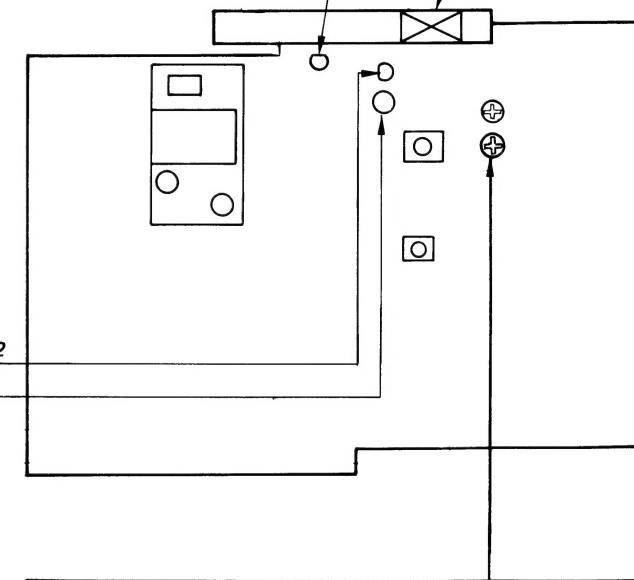
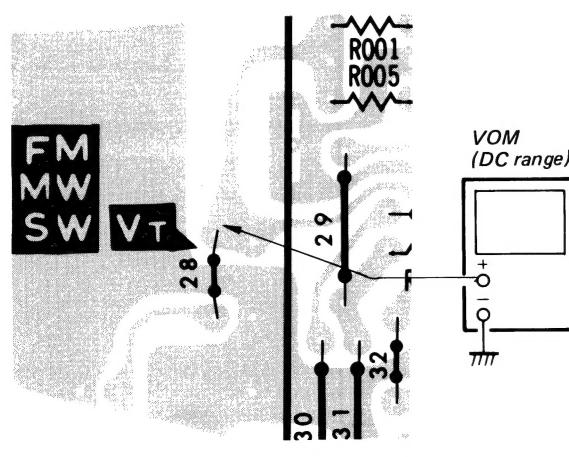
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
1,404 kHz	603 kHz
CT21	L22

AM OSC Voltage Adjustment

Procedure:

1. Set BAND selector switch to AM.
2. Push TUNING (+, -) button for 530 kHz. Adjust L23 for 1 – 1.1 V reading on the VOM.
3. Push the button for 1,611 kHz. Adjust CT22 for 8.0 – 8.5 V reading on the VOM.



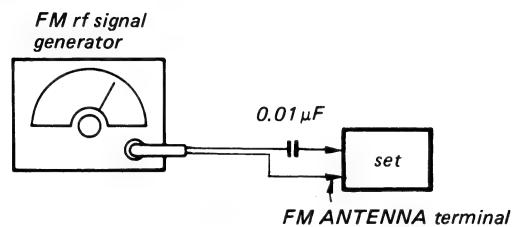
AM Tuned Indication Lighting Level Adjustment

BAND select switch: AM

1. Output 0.7 mV (57 dB), 1,000 kHz from AM rf signal generator.
2. Adjust RT102 so that the LED lights up.

FM SECTION**Setting:**

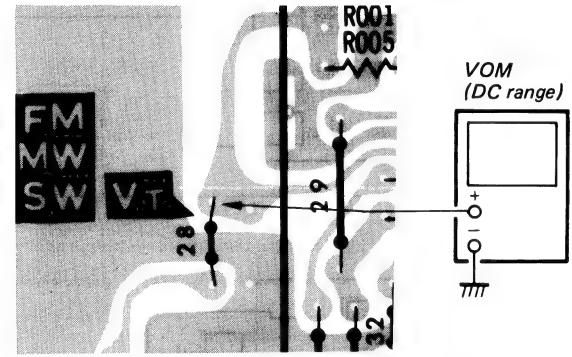
BAND selector switch FM

FM OSC Voltage Adjustment**Setting:**

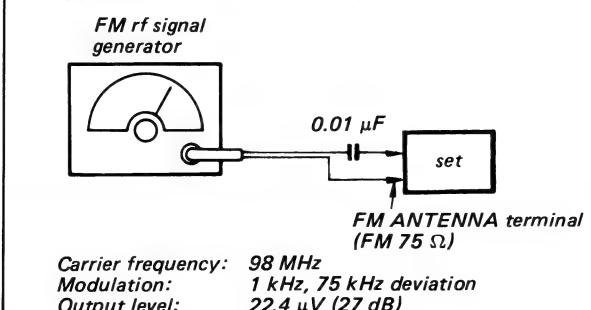
Carrier frequency: 108 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: as low as possible

Procedure:

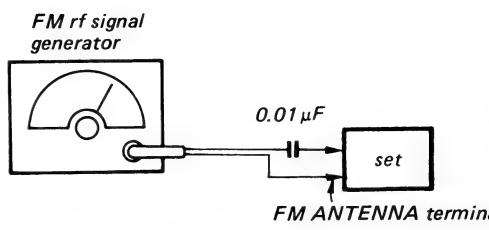
1. Push the TUNING (+, -) button for 108 MHz.
2. Adjust L5 for 8.0 – 8.5 V reading on the VOM.

**FM Muting Level Adjustment****Setting:**

STEREO MUTING switch ON



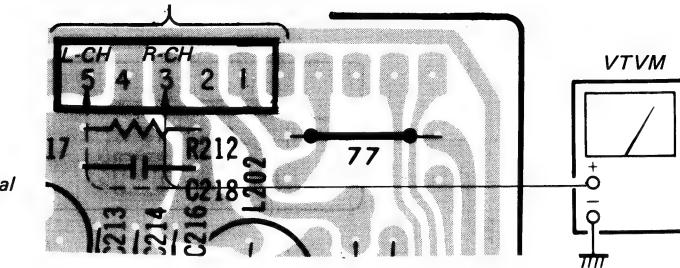
Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 22.4 μV (27 dB)

FM Tracking Adjustment**Setting:**

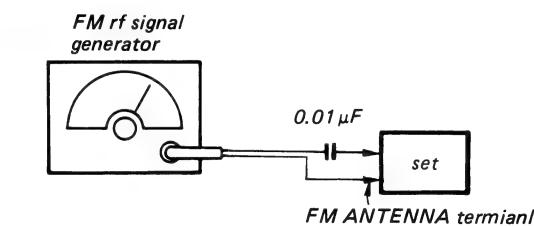
Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 3.16 μV (10 dB)

Procedure:

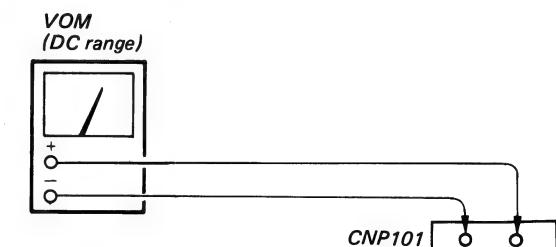
1. Push TUNING (+, -) button for 98 MHz.
2. Approach L2 and L3 not to contact each other.
3. Adjust L1 and L3, and repeat the adjustment 2 – 3 times for maximum VTVM reading.



Note: FM discriminator alignment should be made after FM tracking adjustment.

FM Discriminator Alignment (NULL Check)**Setting:**

Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 1 mV (60 dB)

**Procedure:**

1. Push the TUNING (+, -) button for 98 MHz.
2. Adjust IFT101 for 0 V reading on the VOM.

SECTION 2

DIAGRAMS

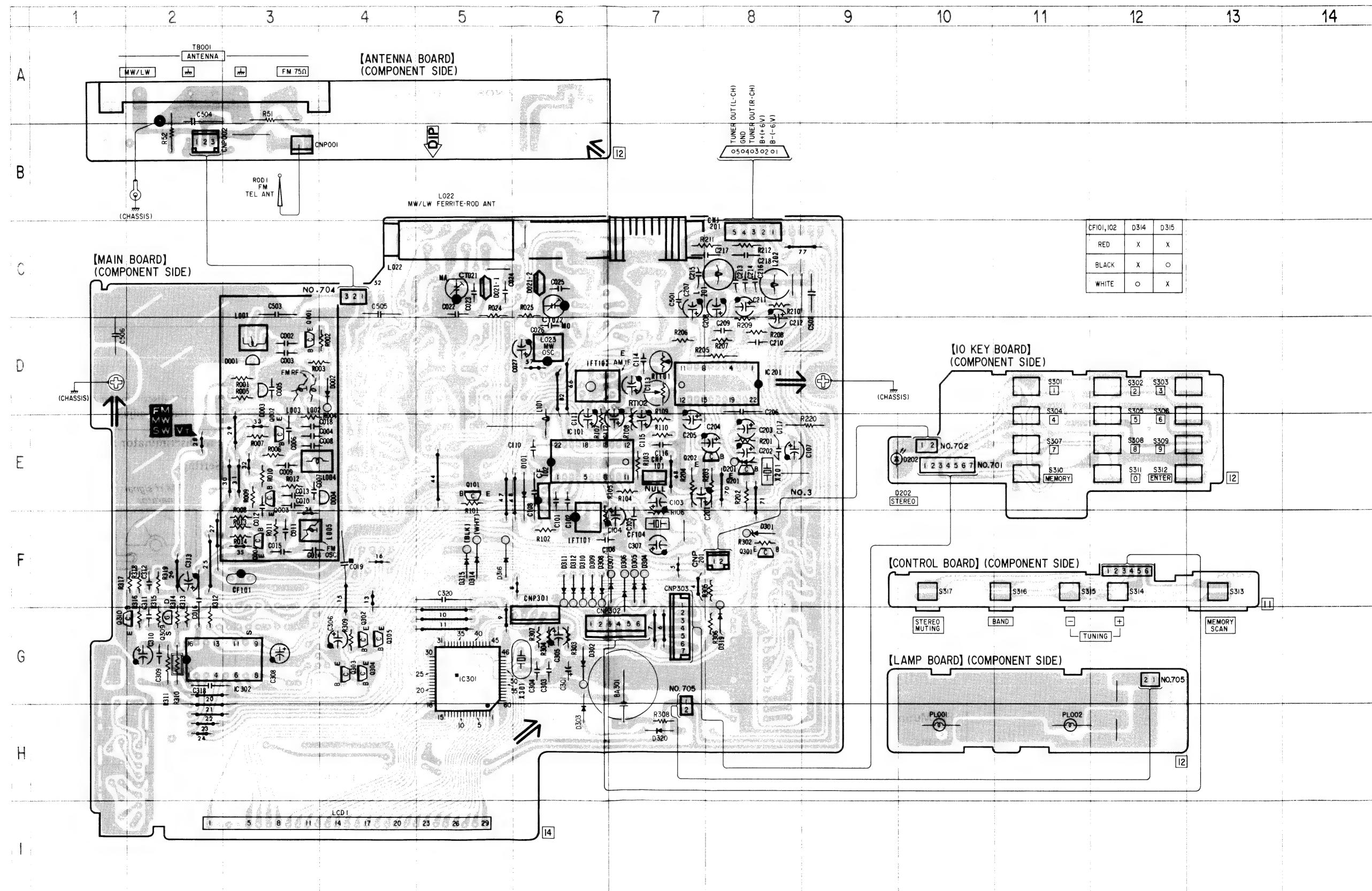
2-1. MOUNTING DIAGRAM

- See page ST-9 for Semiconductor Lead Layouts.

• SEMICONDUCTOR LOCATION

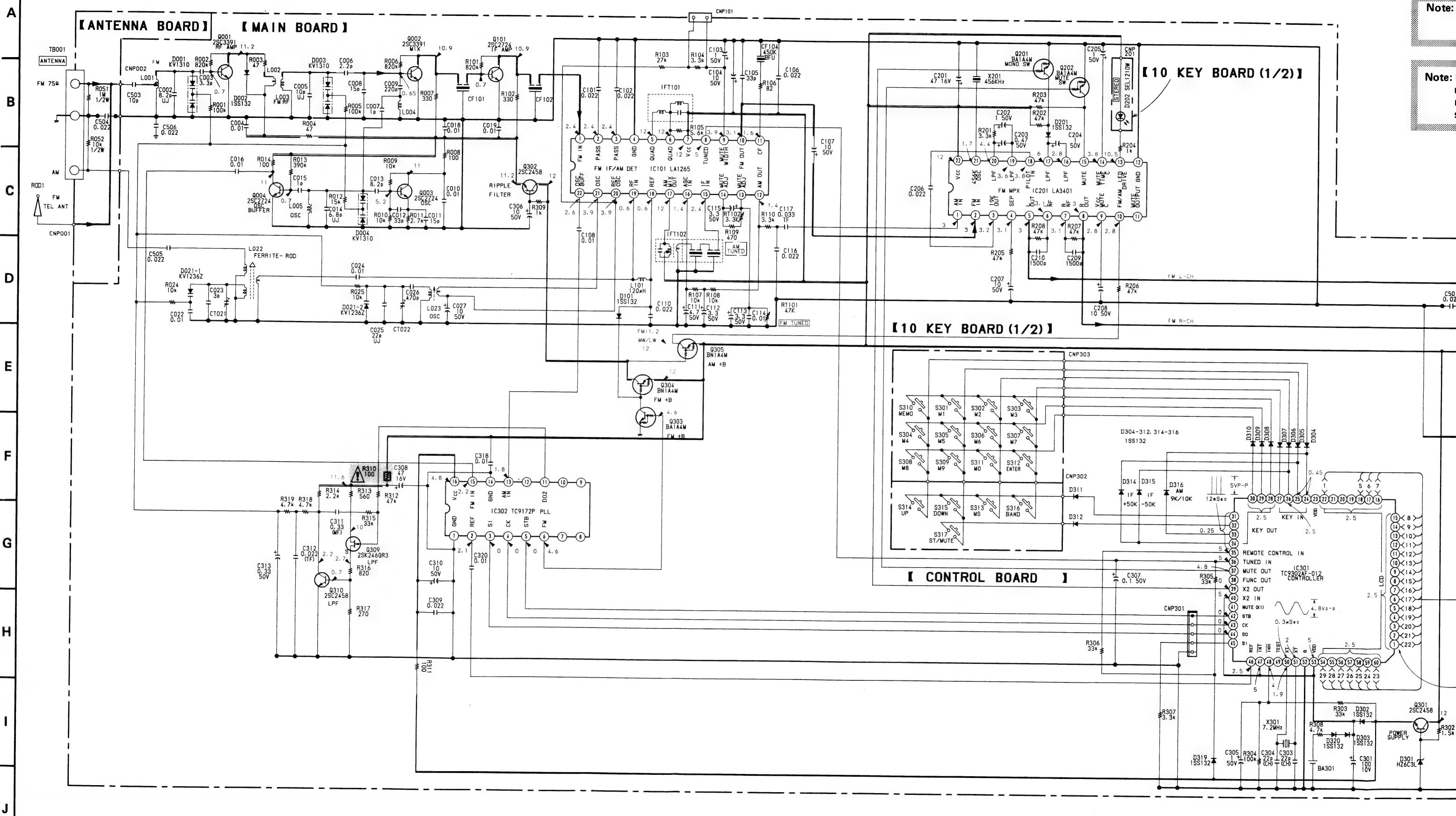
Ref. No.	Location
D001	D-3
D002	D-4
D003	D-3
D004	E-4
D021-1	C-5
D021-2	C-6
D101	E-6
D201	E-8
D202	E-9
D301	F-8
D302	G-6
D303	H-6
D304	F-7
D305	F-7
D306	F-7
D307	F-7
D308	F-6
D309	F-6
D310	F-6
D311	F-6
D312	F-6
D314	F-5
D315	F-5
D316	F-5
D319	G-8
D320	H-7
IC101	E-6
IC201	D-8
IC301	G-5
IC302	G-2
Q001	D-3
Q002	E-3
Q003	E-3
Q004	F-3
Q101	E-5
Q201	E-8
Q202	E-8
Q301	F-8
Q302	G-4
Q303	G-4
Q304	G-4
Q305	G-4
Q309	G-2
Q310	G-2

Note:
• : part mounted on the conductor side.



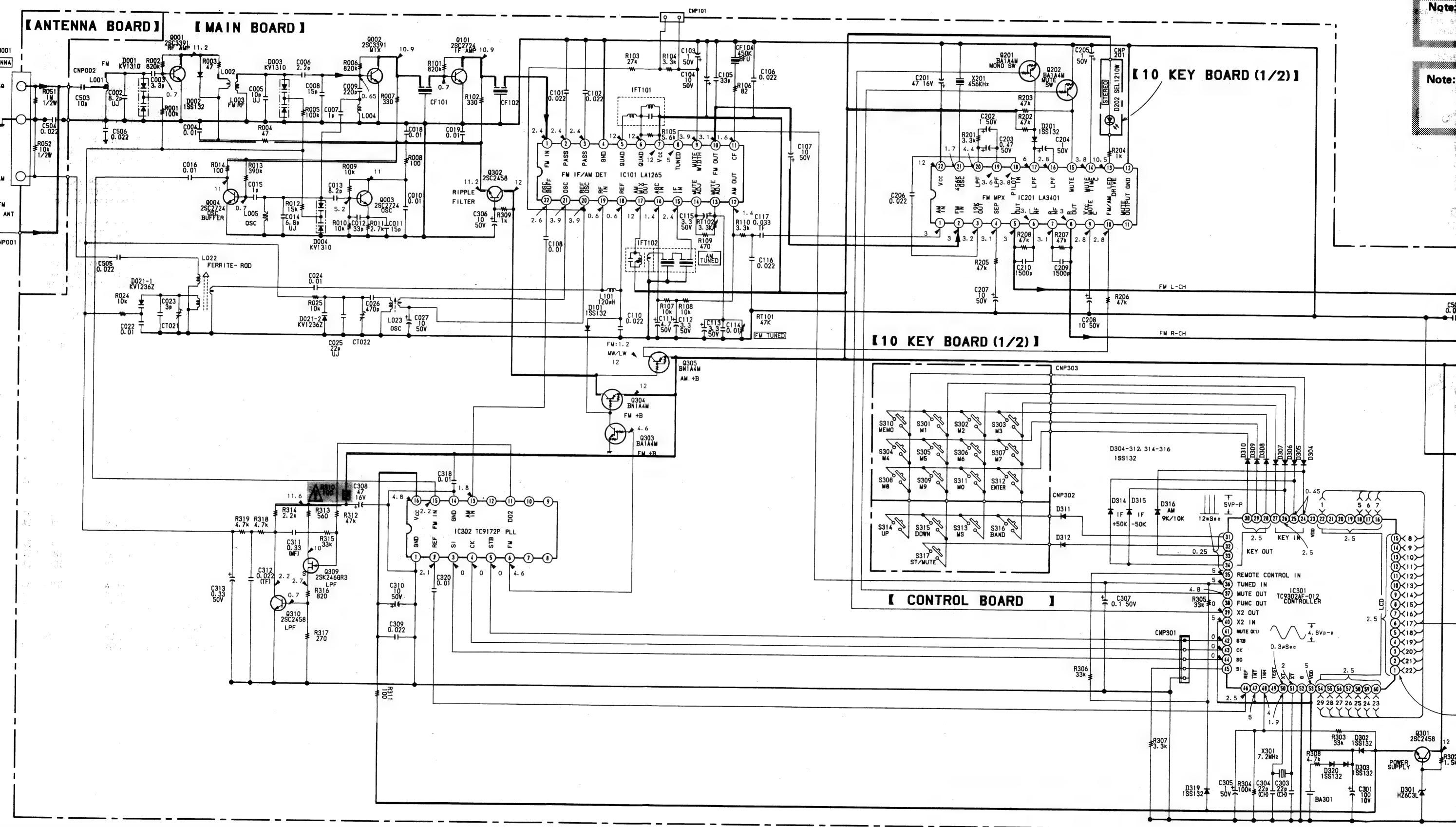
2-2. SCHEMATIC DIAGRAM

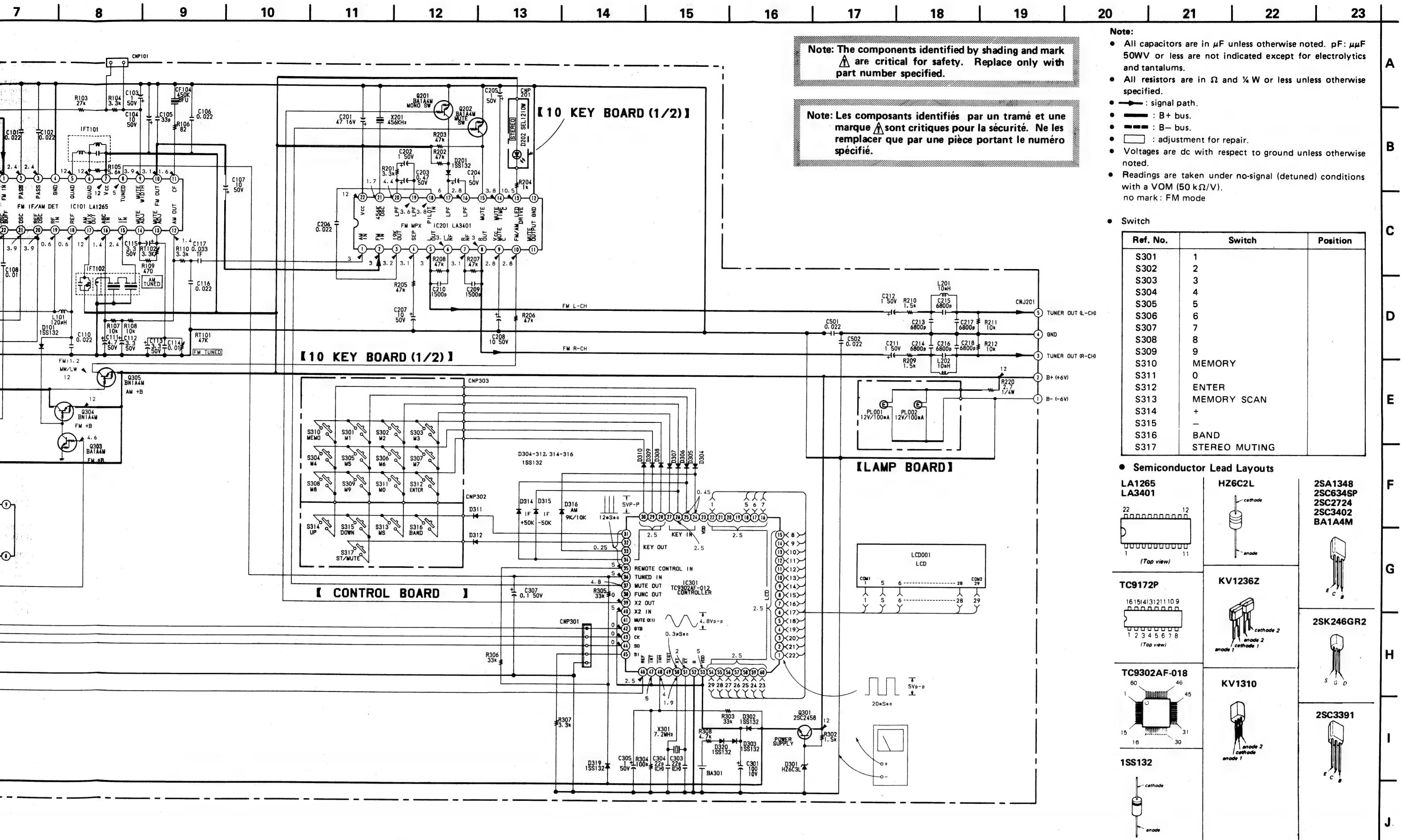
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16



2-2. SCHEMATIC DIAGRAM

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16





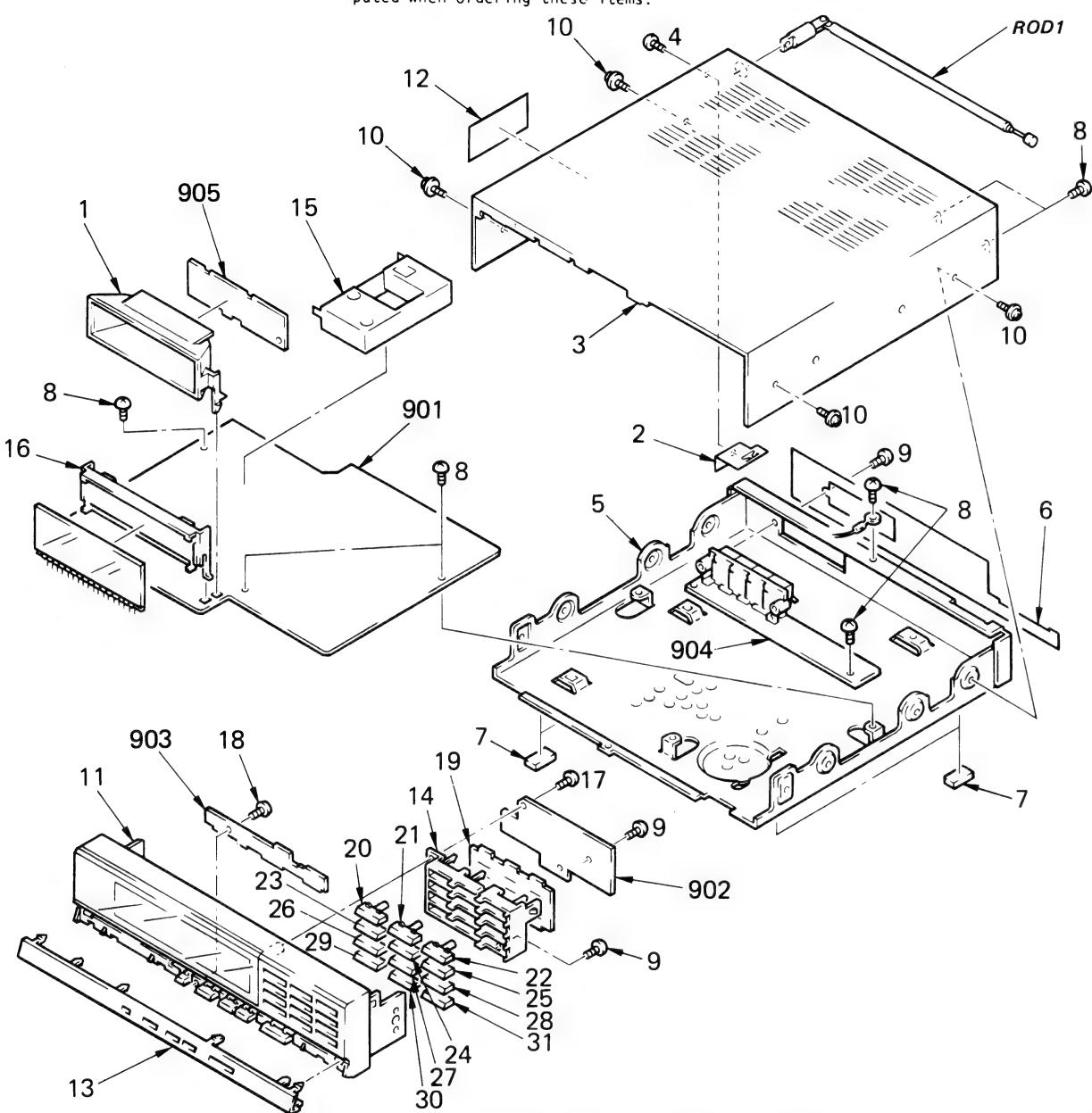
SECTION 3

EXPLODED VIEW AND PARTS LIST

NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The construction parts of an assembled part are indicated with a collation number in the remark column.



SECTION 4
ELECTRICAL PARTS LIST

NOTE:

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μF.

RESISTORS

All resistors are in ohms.
F: nonflammable

COILS

MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

The components identified by shading and mark  are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
	CNP301*1-560-063-00	PIN, CONNECTOR 5P
	CNP302*1-560-064-00	PIN, CONNECTOR 6P
	CNP303*1-564-341-11	PIN, CONNECTOR 7P

CT021	1-141-227-00	CAP, CERAMIC TRIMMER
CT022	1-141-304-21	TRIMMER, CERAMIC

D001	8-719-918-45	DIODE KV1310
D002	8-719-940-76	DIODE 1SS132
D003	8-719-918-45	DIODE KV1310

D004	8-719-918-45	DIODE KV1310
D021	8-719-902-79	DIODE KV1236Z
D101	8-719-940-76	DIODE 1SS132

D201	8-719-940-76	DIODE 1SS132
D202	8-719-303-18	DIODE SEL1210W
D301	8-719-910-63	DIODE HZ6C2L

D302	8-719-940-76	DIODE 1SS132
D303	8-719-940-76	DIODE 1SS132
D304	8-719-940-76	DIODE 1SS132

D305	8-719-940-76	DIODE 1SS132
D306	8-719-940-76	DIODE 1SS132
D307	8-719-940-76	DIODE 1SS132

D308	8-719-940-76	DIODE 1SS132
D309	8-719-940-76	DIODE 1SS132
D310	8-719-940-76	DIODE 1SS132

D311	8-719-940-76	DIODE 1SS132
D312	8-719-940-76	DIODE 1SS132
D313	8-719-940-76	DIODE 1SS132

D314	8-719-940-76	DIODE 1SS132
D315	8-719-940-76	DIODE 1SS132
D316	8-719-940-76	DIODE 1SS132

D317	8-102-959-00	CERAMIC
C211	1-124-611-00	ELECT
C212	1-124-611-00	ELECT

C213	1-161-329-00	CERAMIC
C214	1-161-329-00	CERAMIC
C215	1-161-329-00	CERAMIC

C216	1-161-329-00	CERAMIC
C217	1-161-329-00	CERAMIC
C218	1-161-329-00	CERAMIC

C219	1-161-329-00	CERAMIC
C220	1-161-329-00	CERAMIC
C221	1-161-329-00	CERAMIC

C222	1-161-329-00	CERAMIC
C223	1-161-329-00	CERAMIC
C224	1-161-329-00	CERAMIC

C225	1-161-329-00	CERAMIC
C226	1-161-329-00	CERAMIC
C227	1-161-329-00	CERAMIC

C228	1-161-329-00	CERAMIC
C229	1-161-329-00	CERAMIC
C230	1-161-329-00	CERAMIC

C231	1-161-329-00	CERAMIC
C232	1-161-329-00	CERAMIC
C233	1-161-329-00	CERAMIC

C234	1-161-329-00	CERAMIC
C235	1-161-329-00	CERAMIC
C236	1-161-329-00	CERAMIC

C237	1-161-329-00	CERAMIC
C238	1-161-329-00	CERAMIC
C239	1-161-329-00	CERAMIC

C240	1-161-329-00	CERAMIC
C241	1-161-329-00	CERAMIC
C242	1-161-329-00	CERAMIC

C243	1-161-329-00	CERAMIC
C244	1-161-329-00	CERAMIC
C245	1-161-329-00	CERAMIC

C246</td

ELECTRICAL PARTS

Ref.No.	Part No.	Description	10K	5%	1/6W
R107	1-249-429-11	CARBON	10K	5%	1/6W
R108	1-249-429-11	CARBON	10K	5%	1/6W
R109	1-249-413-11	CARBON	470	5%	1/6W
R110	1-249-423-11	CARBON	3.3K	5%	1/6W
R201	1-249-423-11	CARBON	3.3K	5%	1/6W
R202	1-249-437-11	CARBON	47K	5%	1/6W
R203	1-249-437-11	CARBON	47K	5%	1/6W
R204	1-249-417-11	CARBON	1K	5%	1/6W
R205	1-249-437-11	CARBON	47K	5%	1/6W
R206	1-249-437-11	CARBON	47K	5%	1/6W
R207	1-249-437-11	CARBON	47K	5%	1/6W
R208	1-249-437-11	CARBON	47K	5%	1/6W
R209	1-249-419-11	CARBON	1.5K	5%	1/6W
R210	1-249-419-11	CARBON	1.5K	5%	1/6W
R211	1-249-429-11	CARBON	10K	5%	1/6W
R212	1-249-429-11	CARBON	10K	5%	1/6W
R220	1-249-452-11	CARBON	2.7	5%	1/4W
R302	1-249-419-11	CARBON	1.5K	5%	1/6W
R303	1-249-435-11	CARBON	33K	5%	1/6W
R304	1-249-441-11	CARBON	100K	5%	1/6W
R305	1-249-435-11	CARBON	33K	5%	1/6W
R306	1-249-435-11	CARBON	33K	5%	1/6W
R307	1-249-423-11	CARBON	3.3K	5%	1/6W
R308	1-249-425-11	CARBON	4.7K	5%	1/6W
R309	1-249-417-11	CARBON	1K	5%	1/6W
R310	1-249-405-11	CARBON	100	5%	1/6W
R311	1-249-405-11	CARBON	100	5%	1/6W
R312	1-249-437-11	CARBON	47K	5%	1/6W
R313	1-249-414-11	CARBON	560	5%	1/6W
R314	1-249-421-11	CARBON	2.2K	5%	1/6W
R315	1-249-435-11	CARBON	33K	5%	1/6W
R316	1-249-416-11	CARBON	820	5%	1/6W
R317	1-249-410-11	CARBON	270	5%	1/6W
R318	1-249-425-11	CARBON	4.7K	5%	1/6W
R319	1-249-425-11	CARBON	4.7K	5%	1/6W
ROD1	1-501-270-00	ANTENNA, TELESCOPIC			
RT101	1-228-996-00	RES, ADJ, CARBON 47K			
RT102	1-230-629-11	RES, ADJ, CARBON 3.3K			

ELECTRICAL PARTS

S301	1-554-303-21	SWITCH, KEY BOARD (1)
S302	1-554-303-21	SWITCH, KEY BOARD (2)
S303	1-554-303-21	SWITCH, KEY BOARD (3)
S304	1-554-303-21	SWITCH, KEY BOARD (4)
S305	1-554-303-21	SWITCH, KEY BOARD (5)
S306	1-554-303-21	SWITCH, KEY BOARD (6)
S307	1-554-303-21	SWITCH, KEY BOARD (7)
S308	1-554-303-21	SWITCH, KEY BOARD (8)
S309	1-554-303-21	SWITCH, KEY BOARD (9)
S310	1-554-303-21	SWITCH, KEY BOARD (MEMORY)
S311	1-554-303-21	SWITCH, KEY BOARD (0)
S312	1-554-303-21	SWITCH, KEY BOARD (ENTER)
S313	1-570-876-11	SWITCH, KEY BOARD (MEMORY SCAN)
S314	1-570-876-11	SWITCH, KEY BOARD (+)
S315	1-570-876-11	SWITCH, KEY BOARD (-)
S316	1-570-876-11	SWITCH, KEY BOARD (BAND)
S317	1-570-876-11	SWITCH, KEY BOARD (STEREO MUTING)
T8001	1-536-708-00	TERMINAL BOARD, PUSH 4P
X201	1-567-250-11	OSCILLATOR, CERAMIC (456kHz)
X301	1-567-736-11	VIBRATOR, CRYSTAL (7.2MHz)

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

.FH-209W
FH-204

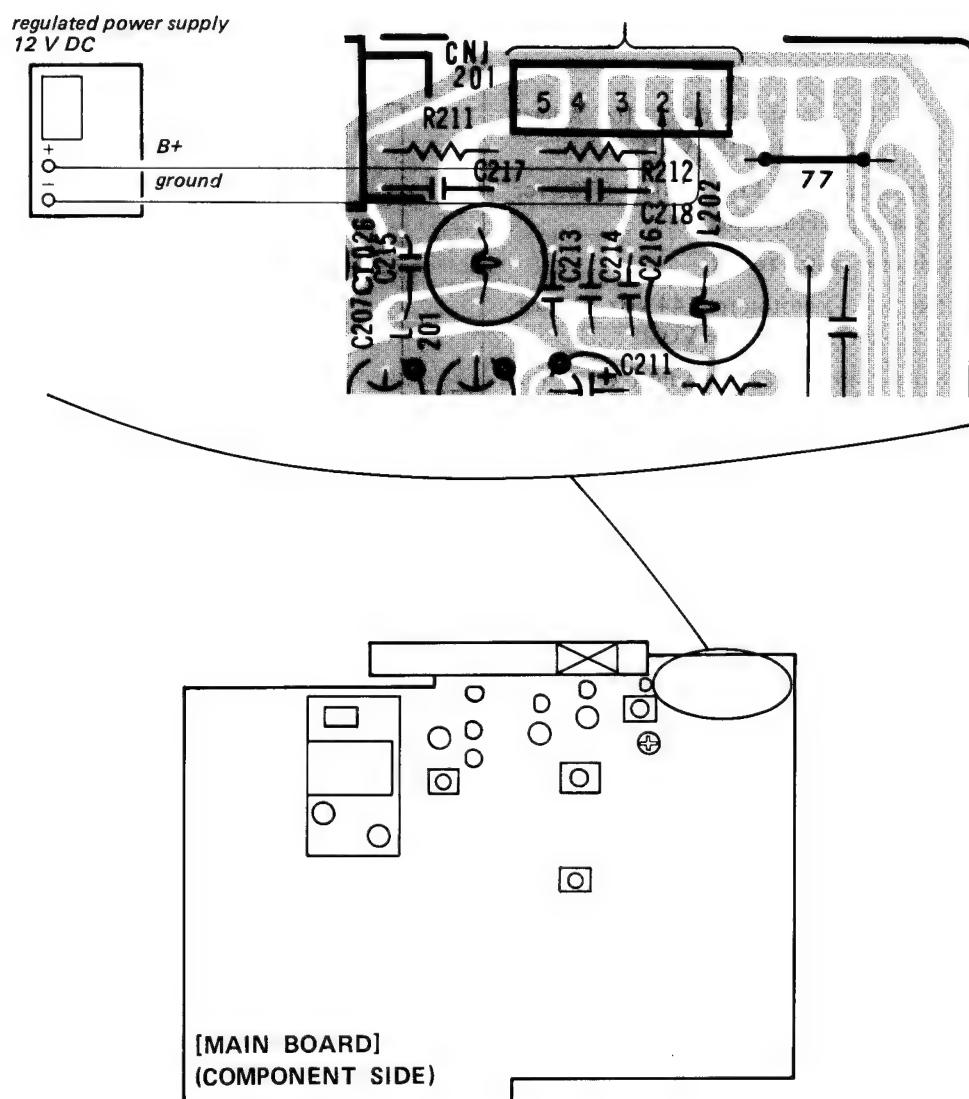
FM STEREO/FM-AM TUNER (ST-209)

*AEP Model
UK Model*

REPAIRING PRECAUTION

[To apply B+ voltage]

The power of this unit is fed from other unit.
When the unit operates individually, connect the regulated power supply to the point as shown in the below fig.



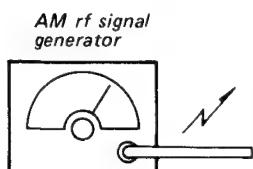
SECTION 1

ELECTRICAL ADJUSTMENTS

AM SECTION

Setting:

BAND selector switch: MW or LW



30% amplitude modulation by 400 Hz signal

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

Put the lead-wire antenna close to the set.

LW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

270 kHz	162 kHz
CT23	L22

MW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

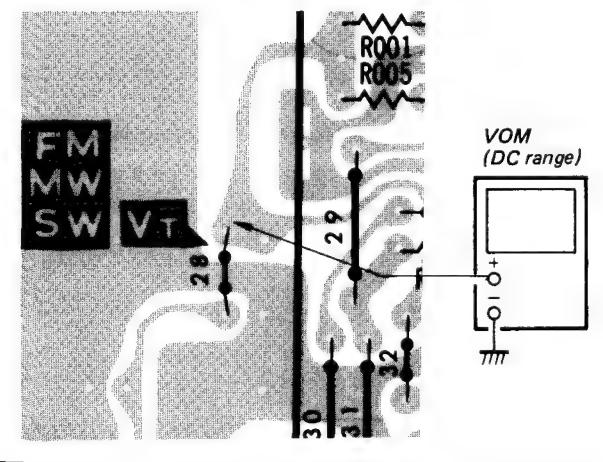
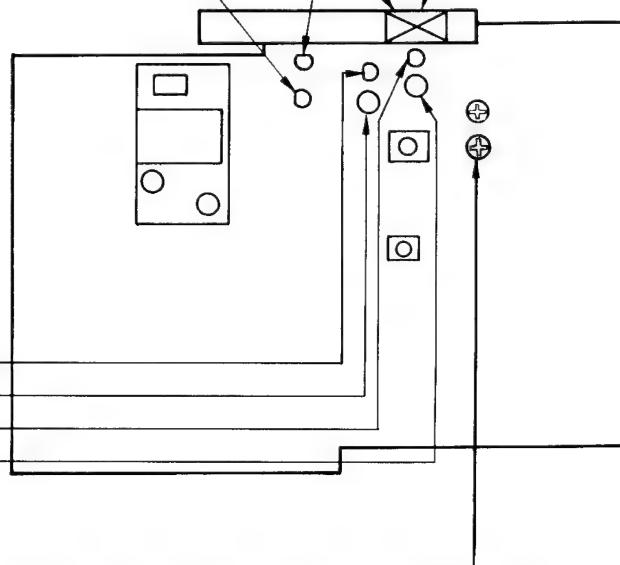
1,404 kHz	603 kHz
CT21	L22

MW/LW OSC Voltage Adjustment

Procedure:

1. Set BAND selector switch to MW.
2. Push TUNING (+, -) button for 531 kHz. Adjust L23 for 1 – 1.1 V reading on the VOM.
3. Push the button for 1,611 kHz. Adjust CT22 for 8.0 – 8.5 V reading on the VOM.
4. Set BAND selector switch to LW.
5. Push TUNING (+, -) button for 144 kHz. Adjust L25 for 1 – 1.1 V reading on the VOM.
6. Push the button for 288 kHz. Adjust CT24 for 8.0 – 8.5 V reading on the VOM.

CT22
L23
CT24
L25



AM Tuned Indication Lighting Level Adjustment

BAND select switch: AM

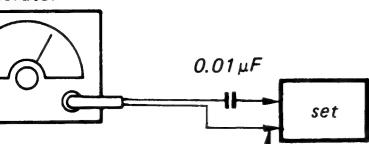
1. Output 0.7 mV (57 dB), 999 kHz from AM rf signal generator.
2. Adjust RT102 so that the LED lights up.

ON

ector switch . . . FM

Voltage Adjustment

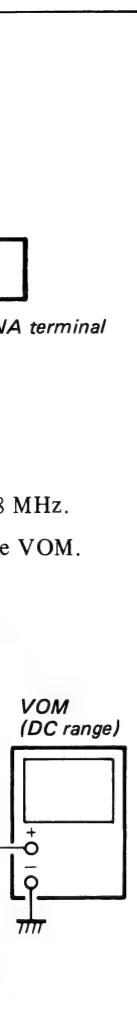
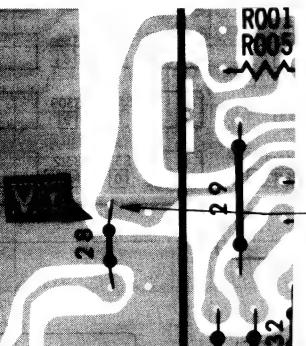
FM rf signal generator



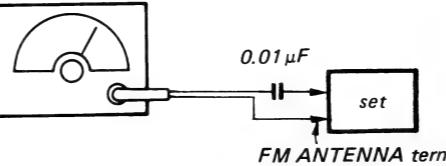
frequency: 108 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: as low as possible

Push TUNING (+, -) button for 108 MHz.

L5 for 8.0 – 8.5 V reading on the VOM.

**FM Tracking Adjustment****Setting:**

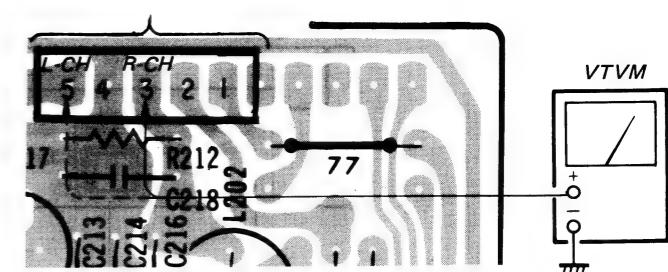
FM rf signal generator



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 3.16 μV (10 dB)

Procedure:

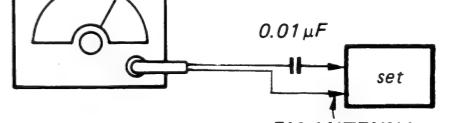
1. Push TUNING (+, -) button for 98 MHz.
2. Approach L2 and L3 not to contact each other.
3. Adjust L1 and L3, and repeat the adjustment 2 – 3 times for maximum VTVM reading.



Note: FM discriminator alignment should be made after FM tracking adjustment.

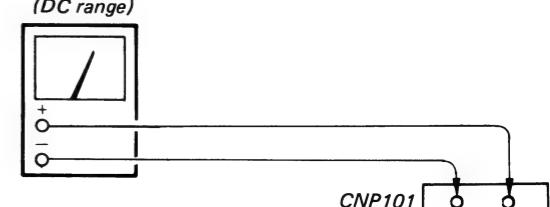
FM Discriminator Alignment (NULL Check)**Setting:**

FM rf signal generator



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 1 mV (60 dB)

VOM (DC range)

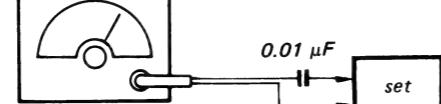
**Procedure:**

1. Push the TUNING (+, -) button for 98 MHz.
2. Adjust IFT101 for 0 V reading on the VOM.

FM Muting Level Adjustment**Setting:**

STEREO MUTING switch . . . ON

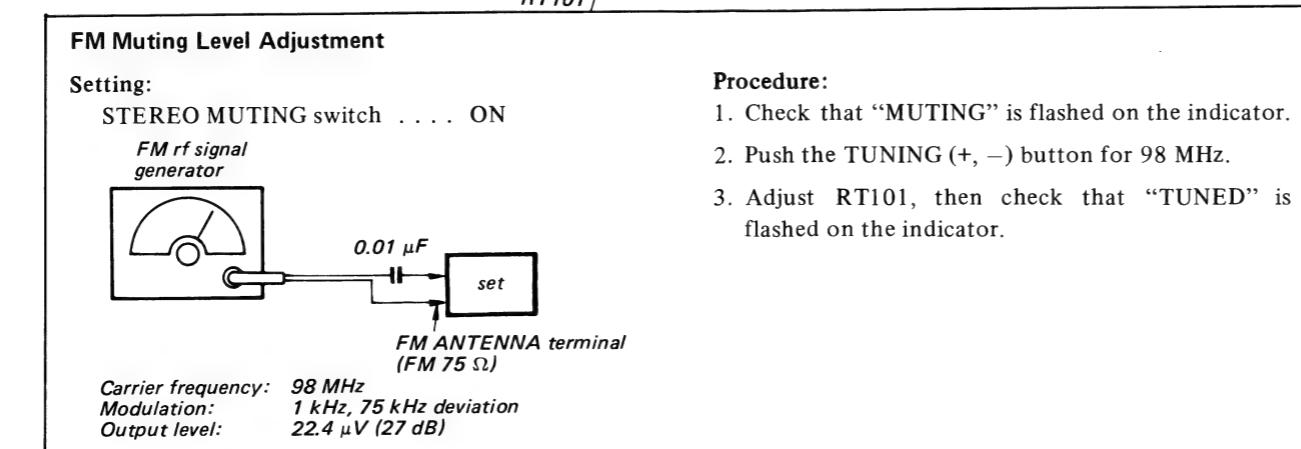
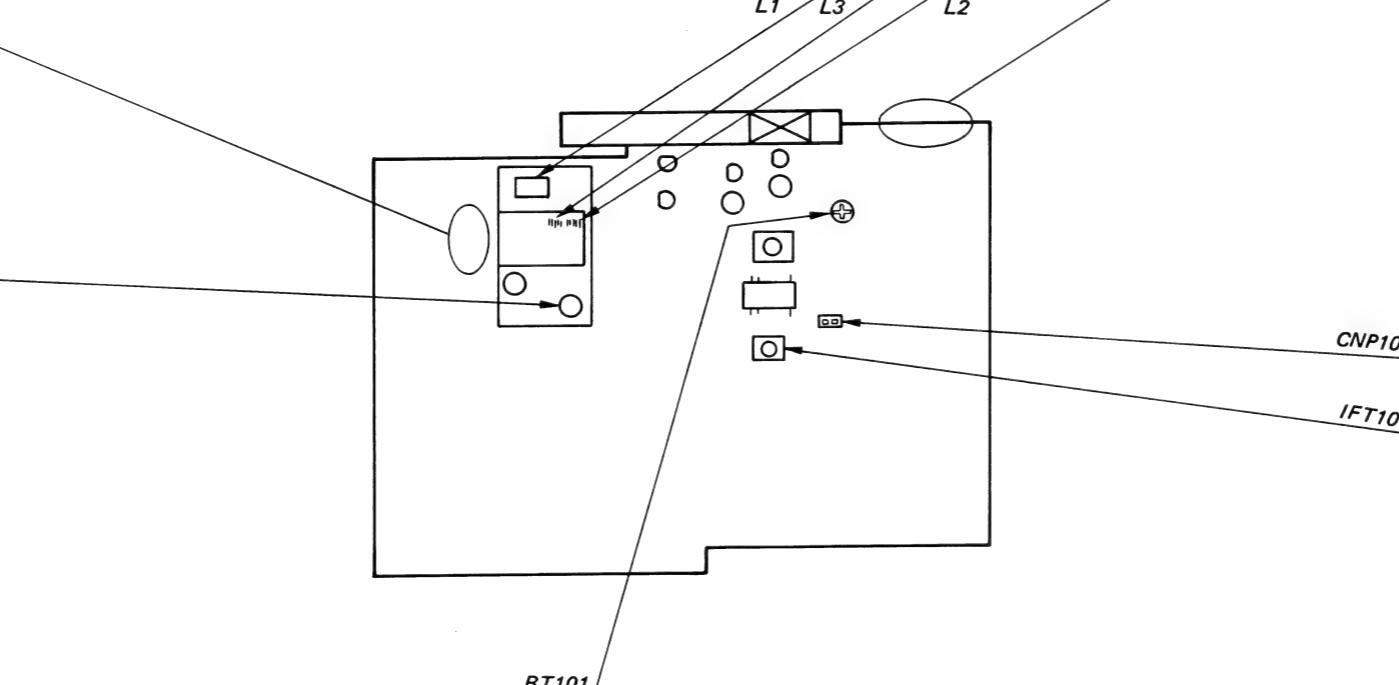
FM rf signal generator



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 22.4 μV (27 dB)

Procedure:

1. Check that "MUTING" is flashed on the indicator.
2. Push the TUNING (+, -) button for 98 MHz.
3. Adjust RT101, then check that "TUNED" is flashed on the indicator.

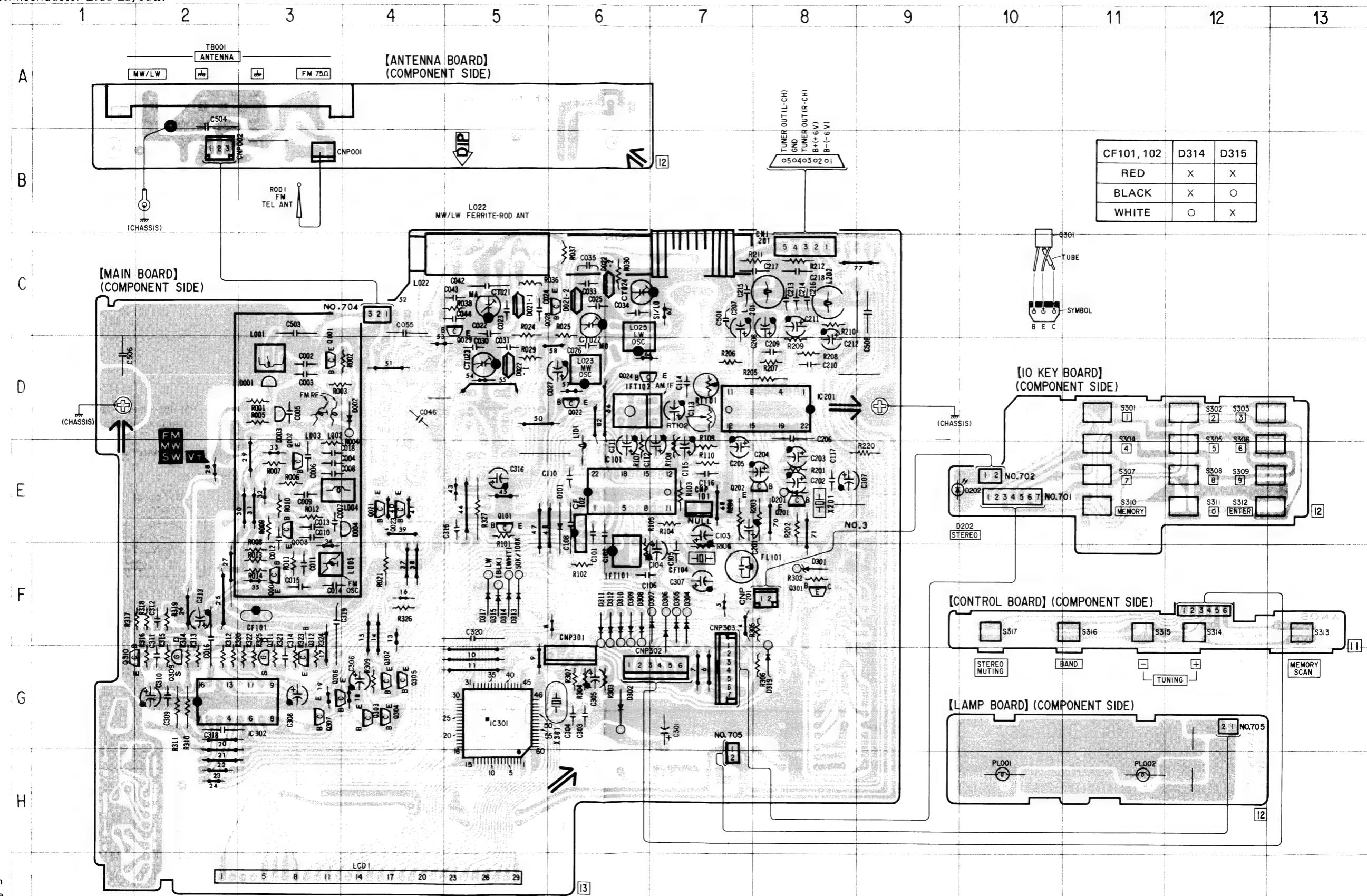


SECTION 2

DIAGRAMS

WIRING DIAGRAM

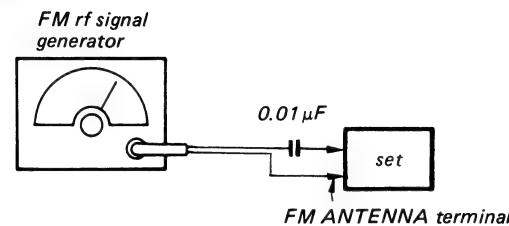
ST-9 for Semiconductor Lead Layouts.



mounted on
ductor side

FM SECTION**Setting:**

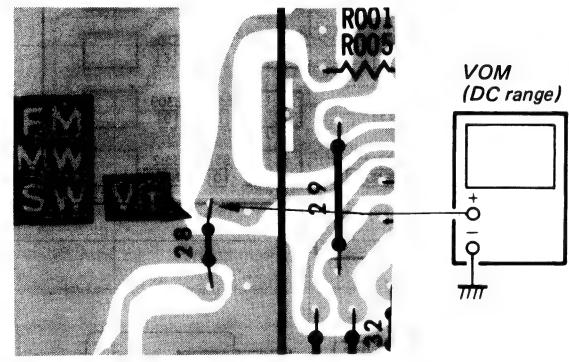
BAND selector switch FM

FM OSC Voltage Adjustment**Setting:**

Carrier frequency: 108 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: as low as possible

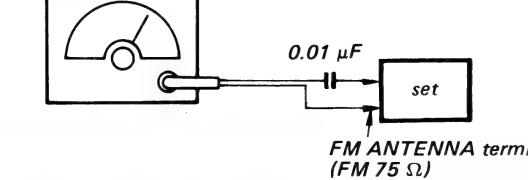
Procedure:

1. Push the TUNING (+, -) button for 108 MHz.
2. Adjust L5 for 8.0 – 8.5 V reading on the VOM.

**FM Muting Level Adjustment****Setting:**

STEREO MUTING switch ON

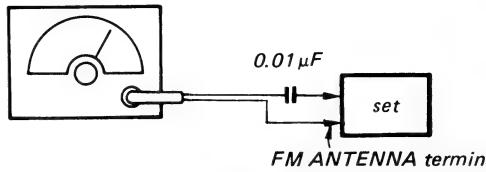
FM rf signal generator



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 22.4 μV (27 dB)

FM Tracking Adjustment**Setting:**

FM rf signal generator



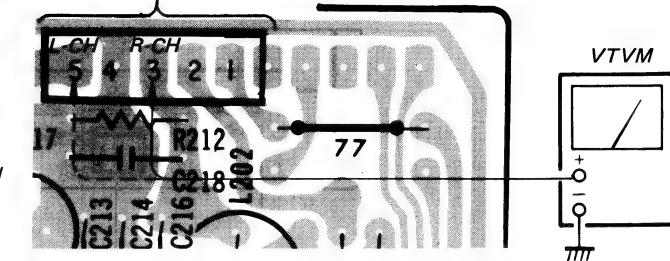
Carrier frequency: 98 MHz

Modulation: 1 kHz, 75 kHz deviation

Output level: 3.16 μV (10 dB)

Procedure:

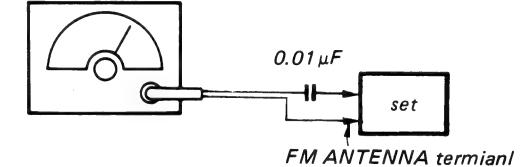
1. Push TUNING (+, -) button for 98 MHz.
2. Approach L2 and L3 not to contact each other.
3. Adjust L1 and L3, and repeat the adjustment 2 – 3 times for maximum VTVM reading.



Note: FM discriminator alignment should be made after FM tracking adjustment.

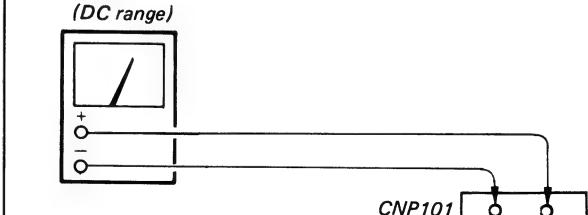
FM Discriminator Alignment (NULL Check)**Setting:**

FM rf signal generator



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation
Output level: 1 mV (60 dB)

VOM (DC range)

**Procedure:**

1. Check that "MUTING" is flashed on the indicator.
2. Push the TUNING (+, -) button for 98 MHz.
3. Adjust RT101, then check that "TUNED" is flashed on the indicator.

1. Push the TUNING (+, -) button for 98 MHz.
2. Adjust IFT101 for 0 V reading on the VOM.

SECTION 2

DIAGRAMS

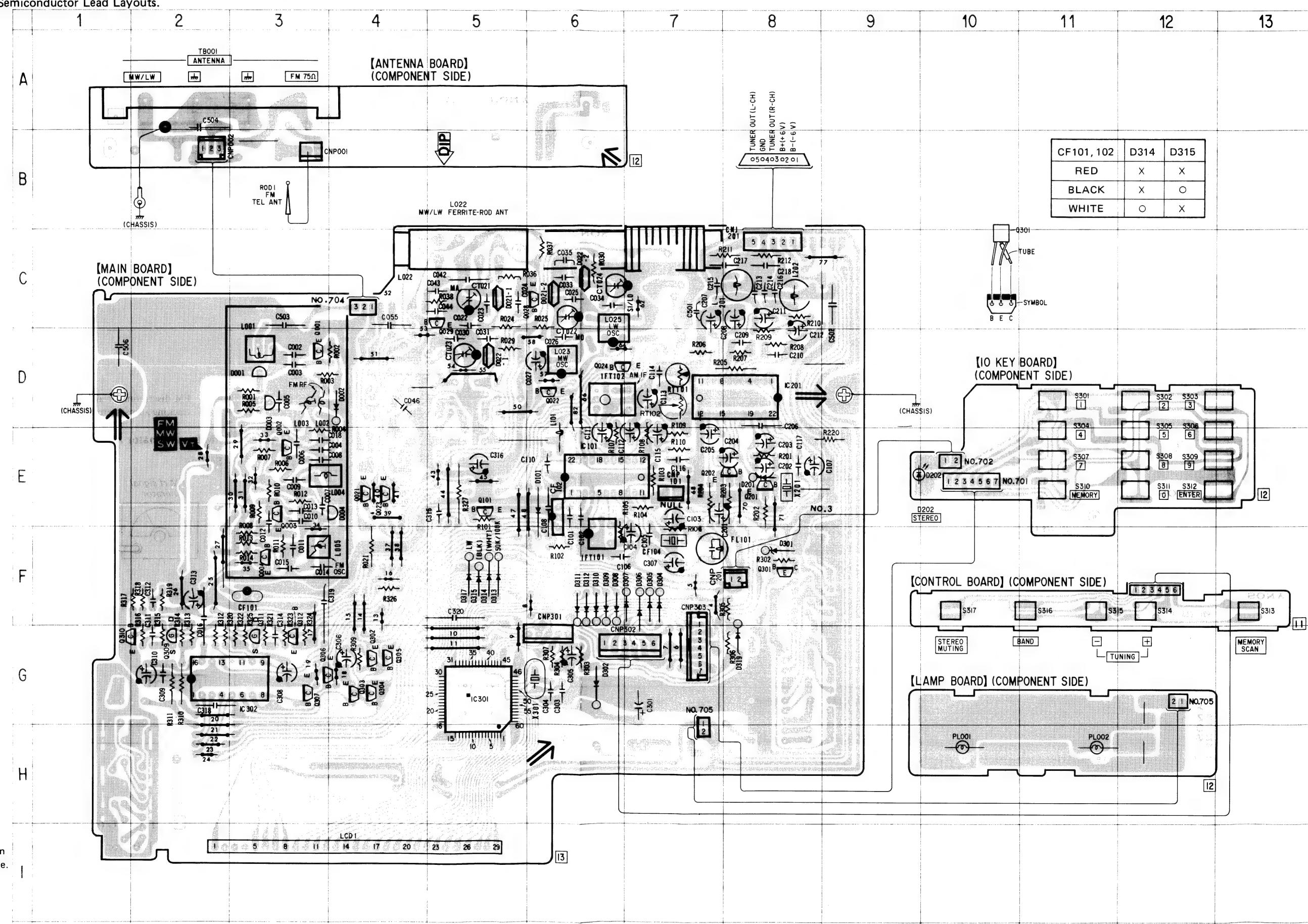
2-1. MOUNTING DIAGRAM

- See page ST-9 for Semiconductor Lead Layouts.

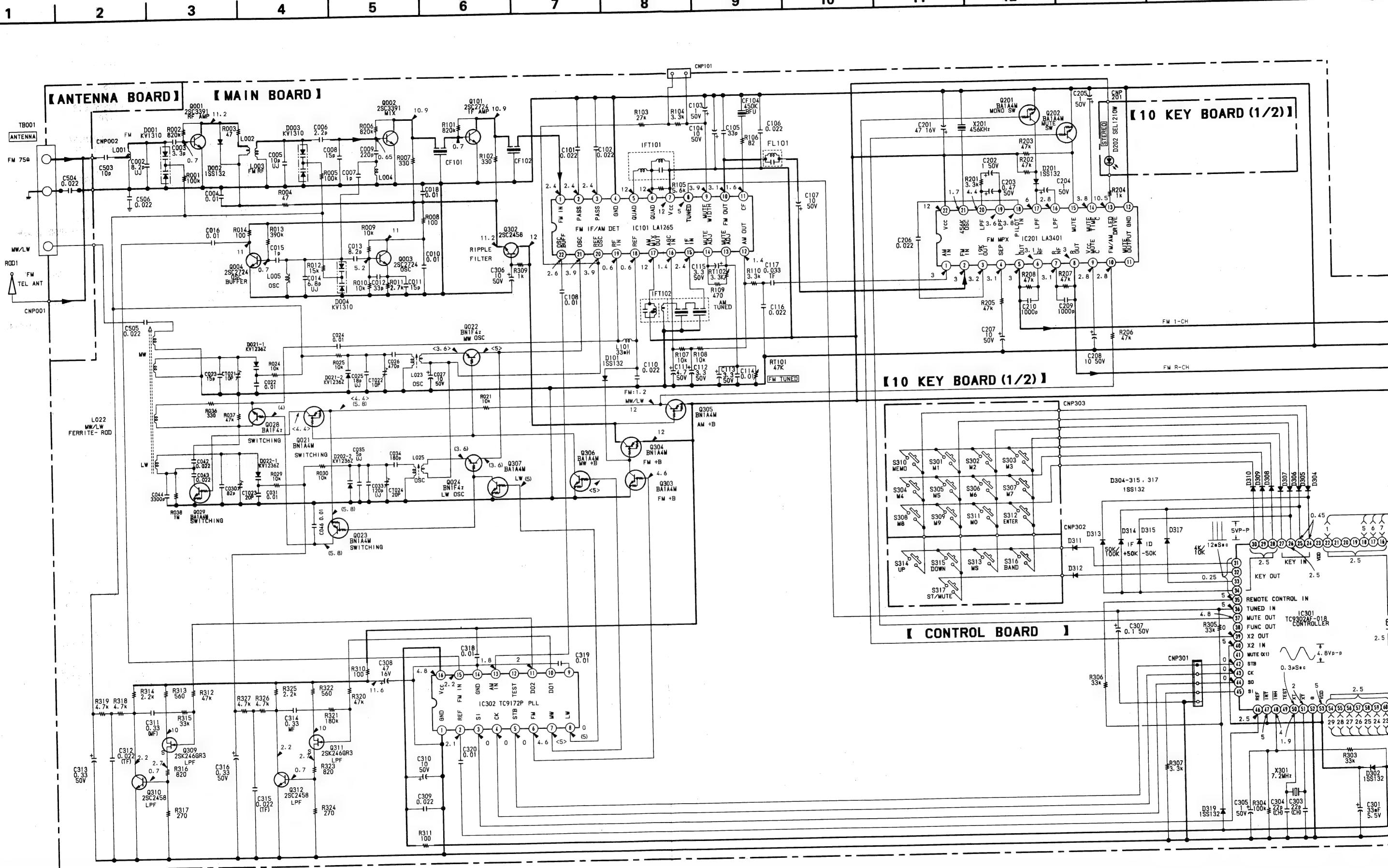
• SEMICONDUCTOR LOCATION

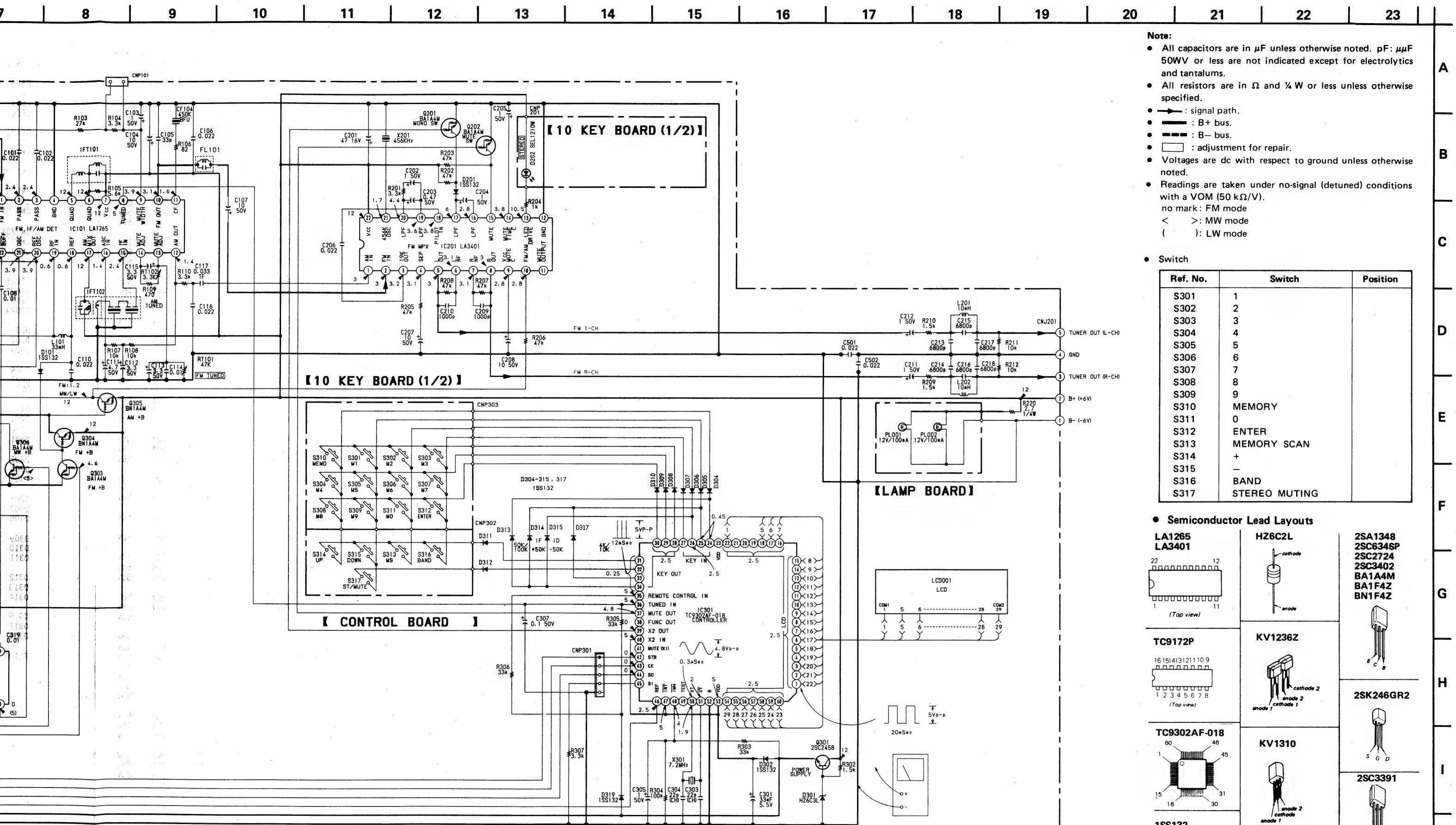
Ref. No.	Location
D001	D-3
D002	D-4
D003	D-3
D004	E-4
D021-1	C-5
D021-2	C-6
D022-1	D-5
D022-2	C-6
D101	E-6
D201	E-8
D301	F-8
D302	G-6
D304	F-7
D305	F-7
D306	F-7
D307	F-7
D308	F-6
D309	F-6
D310	F-6
D311	F-6
D312	F-6
D313	F-5
D314	F-5
D315	F-5
D317	F-5
D319	G-8
IC101	E-6
IC201	D-8
IC301	G-5
IC302	G-2
Q001	D-3
Q002	E-3
Q003	E-3
Q004	F-3
Q021	E-4
Q022	D-6
Q023	E-4
Q024	D-6
Q028	C-6
Q029	D-5
Q101	E-4
Q201	E-8
Q202	E-8
Q301	F-8
Q302	G-4
Q303	G-4
Q304	G-4
Q305	G-4
Q306	G-3
Q307	G-3
Q309	G-2
Q310	G-1
Q311	G-3
Q312	G-3

Note:
■ : part mounted on the conductor side.



2-2. SCHEMATIC DIAGRAM





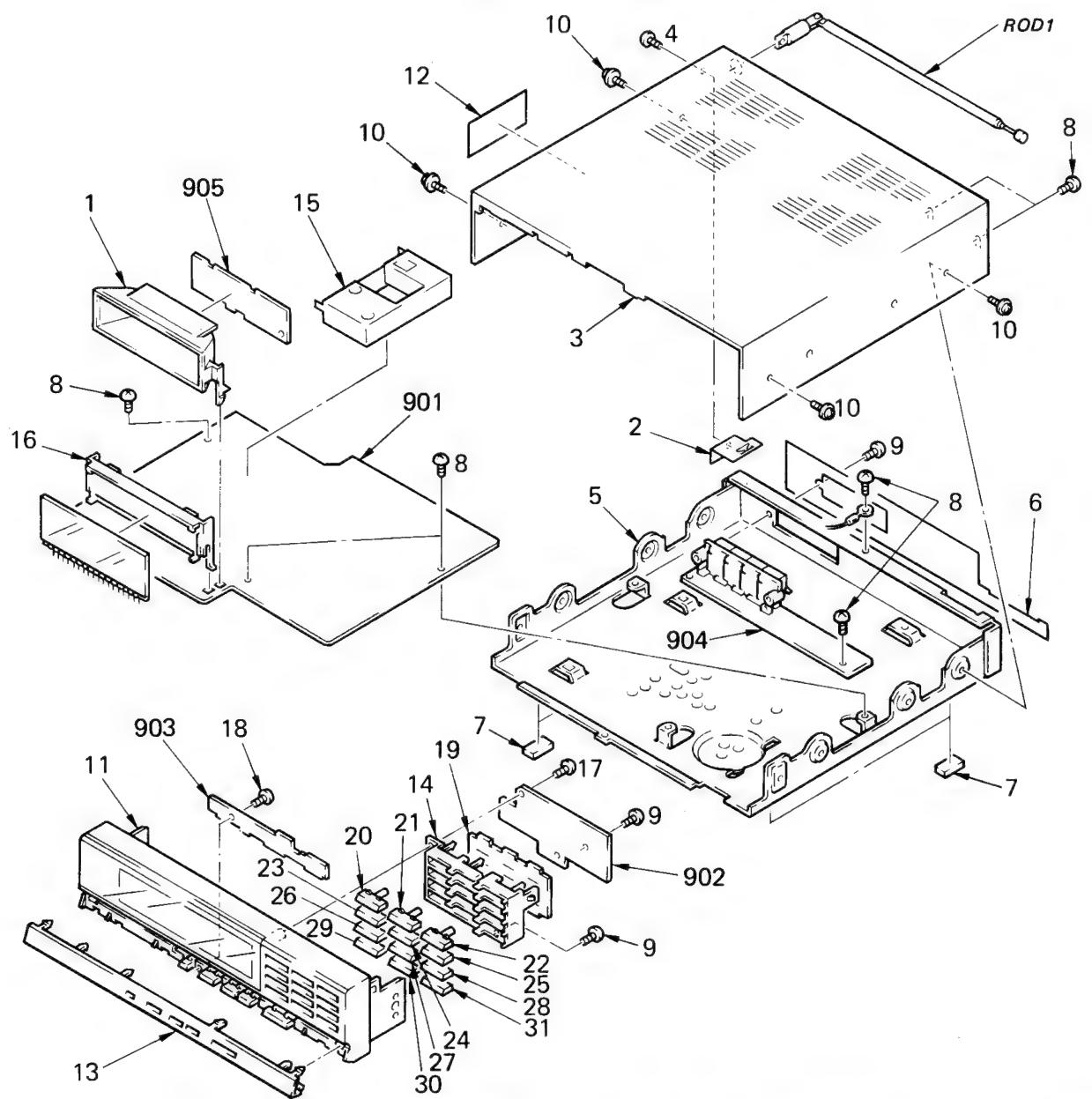
SECTION 3

EXPLODED VIEW AND PARTS LIST

NOTE:
• The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The construction parts of an assembled part are indicated with a collation number in the remark column.



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	*4-917-275-01	HOUSE, LAMP		19	*4-919-607-01	SPACER	
2	*4-919-611-01	BRACKET, ANT		20	4-920-176-01	BUTTON (1)	
3	4-920-137-01	CASE		21	4-920-176-11	BUTTON (2)	
4	7-682-147-09	SCREW +B 3X6		22	4-920-176-21	BUTTON (3)	
5	*4-919-617-01	CHASSIS		23	4-920-176-31	BUTTON (4)	
6	*4-919-613-11	COVER, REAR		24	4-920-176-41	BUTTON (5)	
7	4-919-608-01	FOOT		25	4-920-176-51	BUTTON (6)	
8	7-682-147-01	SCREW +BVTT 3X6 (S)		26	4-920-176-61	BUTTON (7)	
9	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		27	4-920-176-71	BUTTON (8)	
10	7-682-148-09	SCREW, M3 CASE STOPPER		28	4-920-176-81	BUTTON (9)	
11	X-4919-627-1	PANEL ASSY		29	4-920-175-01	BUTTON (MEMORY)	
12	*4-919-668-01	LABEL, MODEL NUMBER (AE)		30	4-920-176-91	BUTTON (0)	
13	4-919-616-02	PANEL, CONTROL		31	4-920-175-11	BUTTON (ENTER)	
14	*4-919-614-01	RETAINER, BUTTON		901	*A-4351-585-A	MOUNTED PCB, TUNER	
15	*4-874-704-01	CASE, SHIELD		902	*1-622-167-12	PC BOARD, 10 KEY	
16	*4-909-633-01	ILLUMINATOR		903	*1-622-168-11	PC BOARD, CONTROL	
17	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S		904	*1-622-169-12	PC BOARD, ANTENNA	
18	7-685-133-19	SCREW +P 2.6X6 TYPE2 SLIT		905	*1-622-170-12	PC BOARD, LAMP	
				R001	1-501-270-00	ANTENNA, TELESCOPIC	

SECTION 4

ELECTRICAL PARTS LIST

NOTE :

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μ F, PF: μ u

RESISTORS

· F : nonflammable

COILS

· MMH : mH, UH : μ H

SEMICONDUCTORS

In each case, $U \propto \mu$, for example:
UA...: μA ..., UPA...: μPA ..., UPC...: μPC ,
UPD...: μPD ...

ELECTRICAL PARTS					ELECTRICAL PARTS						
Ref.No.	Part No.	Description			Ref.No.	Part No.	Description				
901	*A-4351-585-A	OUNTED PCB, TUNER			C111	1-124-927-11	ELECT	4.7MF	20%	50V	
902	*1-622-167-12	PC BOARD, 10 KEY			C112	1-123-382-00	ELECT	3.3MF	20%	50V	
903	*1-622-168-11	PC BOARD, CONTROL			C113	1-123-382-00	ELECT	3.3MF	20%	50V	
904	*1-622-169-12	PC BOARD, ANTENNA			C114	1-161-379-00	CERAMIC	0.01MF	20%	16V	
905	*1-622-170-12	PC BOARD, LAMP			C115	1-123-382-00	ELECT	3.3MF	20%	50V	
C002	1-162-198-31	CERAMIC	8.2PF	10%	50V	C116	1-101-005-00	CERAMIC	0.022MF		50V
C003	1-162-193-31	CERAMIC	3.3PF	10%	50V	C117	1-130-489-00	MYLAR	0.033MF	5%	50V
C004	1-161-379-00	CERAMIC	0.01MF	20%	16V	C201	1-124-477-11	ELECT	47MF	20%	16V
C005	1-162-199-31	CERAMIC	10PF	5%	50V	C202	1-124-791-11	ELECT	1MF	20%	50V
C006	1-162-191-31	CERAMIC	2.2PF	10%	50V	C203	1-124-902-00	ELECT	0.47MF	20%	50V
C007	1-162-187-31	CERAMIC	1PF	20%	50V	C204	1-124-791-11	ELECT	1MF	20%	50V
C008	1-162-203-31	CERAMIC	15PF	5%	50V	C205	1-124-791-11	ELECT	1MF	20%	50V
C009	1-162-286-31	CERAMIC	220PF	10%	50V	C206	1-161-494-00	CERAMIC	0.022MF	30%	25V
C010	1-161-379-00	CERAMIC	0.01MF	20%	16V	C207	1-123-875-91	ELECT	10MF	20%	50V
C011	1-162-203-31	CERAMIC	15PF	5%	50V	C208	1-123-875-91	ELECT	10MF	20%	50V
C012	1-162-211-31	CERAMIC	33PF	5%	50V	C209	1-102-074-00	CERAMIC	0.001MF	10%	50V
C013	1-162-198-31	CERAMIC	8.2PF	10%	50V	C210	1-102-074-00	CERAMIC	0.001MF	10%	50V
C014	1-162-197-31	CERAMIC	6.8PF	10%	50V	C211	1-124-611-00	ELECT	1MF	20%	50V
C015	1-162-187-31	CERAMIC	1PF	20%	50V	C212	1-124-611-00	ELECT	1MF	20%	50V
C016	1-161-379-00	CERAMIC	0.01MF	20%	16V	C213	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C017	1-161-379-00	CERAMIC	0.01MF	20%	16V	C214	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C018	1-161-379-00	CERAMIC	0.01MF	20%	16V	C215	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C019	1-161-379-00	CERAMIC	0.01MF	20%	16V	C216	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C020	1-102-936-00	CERAMIC	3PF	0.25PF	50V	C217	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C021	1-161-379-00	CERAMIC	0.01MF	20%	16V	C218	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C022	1-102-893-00	CERAMIC	18PF	5%	50V	C301	1-126-211-51	ELECT	33000MF		5.5V
C023	1-130-014-00	FILM	470PF	5%	50V	C303	1-102-959-00	CERAMIC	22PF	5%	50V
C024	1-161-379-00	CERAMIC	0.01MF	20%	16V	C219	1-161-329-00	CERAMIC	0.0068MF	20%	16V
C025	1-102-971-00	CERAMIC	82PF	5%	50V	C304	1-102-959-00	CERAMIC	22PF	5%	50V
C026	1-161-379-00	CERAMIC	0.01MF	20%	16V	C305	1-124-791-11	ELECT	1MF	20%	50V
C027	1-123-875-91	ELECT	10MF	20%	50V	C306	1-123-875-91	ELECT	10MF	20%	50V
C028	1-102-971-00	CERAMIC	82PF	5%	50V	C307	1-124-463-00	ELECT	0.1MF	20%	50V
C029	1-161-379-00	CERAMIC	0.01MF	20%	16V	C308	1-124-477-11	ELECT	47MF	20%	16V
C030	1-102-816-00	CERAMIC	120PF	5%	50V	C309	1-101-005-00	CERAMIC	0.022MF		50V
C031	1-130-047-00	FILM	180PF	5%	50V	C310	1-124-463-00	ELECT	0.1MF	20%	50V
C032	1-102-942-00	CERAMIC	5PF	0.5PF	50V	C311	1-124-791-11	ELECT	47MF	20%	16V
C033	1-102-816-00	CERAMIC	120PF	5%	50V	C312	1-101-005-00	CERAMIC	0.022MF		50V
C034	1-130-047-00	FILM	180PF	5%	50V	C313	1-124-252-00	ELECT	0.33MF	20%	50V
C035	1-102-942-00	CERAMIC	5PF	0.5PF	50V	C314	1-136-171-00	FILM	0.33MF	5%	50V
C036	1-161-494-00	CERAMIC	0.022MF	30%	25V	C315	1-130-487-00	MYLAR	0.022MF	5%	50V
C037	1-101-005-00	CERAMIC	0.022MF		50V	C316	1-124-252-00	ELECT	0.33MF	20%	50V
C038	1-161-327-00	CERAMIC	0.0033MF	20%	16V	C317	1-124-252-00	ELECT	0.33MF	20%	50V
C039	1-161-379-00	CERAMIC	0.01MF	20%	16V	C318	1-161-379-00	CERAMIC	0.01MF	20%	16V
C040	1-101-005-00	CERAMIC	0.022MF		50V	C319	1-161-379-00	CERAMIC	0.01MF	20%	16V
C041	1-101-005-00	CERAMIC	0.022MF		50V	C320	1-161-379-00	CERAMIC	0.01MF	20%	16V
C042	1-161-379-00	CERAMIC	0.01MF	20%	16V	C501	1-161-494-00	CERAMIC	0.022MF	30%	25V
C043	1-101-005-00	CERAMIC	0.022MF		50V	C502	1-161-494-00	CERAMIC	0.022MF	30%	25V
C044	1-161-327-00	CERAMIC	0.0033MF	20%	16V	C503	1-161-494-00	CERAMIC	0.022MF	30%	25V
C045	1-161-379-00	CERAMIC	0.01MF	20%	16V	C504	1-161-494-00	CERAMIC	0.022MF	30%	25V
C101	1-101-005-00	CERAMIC	0.022MF		50V	C505	1-161-494-00	CERAMIC	0.022MF	30%	25V
C102	1-101-005-00	CERAMIC	0.022MF		50V	C506	1-161-494-00	CERAMIC	0.022MF	30%	25V
C103	1-124-791-11	ELECT	1MF	20%	50V	C507	1-161-494-00	CERAMIC	0.022MF	30%	25V
C104	1-123-875-91	ELECT	10MF	20%	50V	C508	1-161-494-00	CERAMIC	0.022MF	30%	25V
C105	1-162-211-31	CERAMIC	33PF	5%	50V	C509	1-161-494-00	CERAMIC	0.022MF	30%	25V
C106	1-101-005-00	CERAMIC	0.022MF		50V	C510	1-161-494-00	CERAMIC	0.022MF	30%	25V
C107	1-123-875-91	ELECT	10MF	20%	50V	C511	1-161-494-00	CERAMIC	0.022MF	30%	25V
C108	1-161-379-00	CERAMIC	0.01MF	20%	16V	C512	1-161-494-00	CERAMIC	0.022MF	30%	25V
C109	1-101-005-00	CERAMIC	0.022MF		50V	C513	1-161-494-00	CERAMIC	0.022MF	30%	25V
C110	1-101-005-00	CERAMIC	0.022MF		50V	C514	1-161-494-00	CERAMIC	0.022MF	30%	25V

SECTION 4
ELECTRICAL PARTS LIST

NOTE:

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μ F, PF: μ PF.

RESISTORS:
All resistors are in ohms.

F: nonflammable

COILS:
MMH: mH, UH: μ H

SEMICONDUCTORS
In each case, U: μ , for example:
UA...: μ A..., UPA...: μ PA..., UPC...: μ PC,
UPD...: μ PD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description	50V	25V	25V
C503	1-162-199-31	CERAMIC	10PF	5%	50V
C504	1-161-494-00	CERAMIC	0.022MF	30%	25V
C505	1-161-494-00	CERAMIC	0.022MF	30%	25V
C506	1-161-494-00	CERAMIC	0.022MF	30%	25V

CF101	1-527-968-00	FILTER, CERAMIC
CF102	1-527-968-00	FILTER, CERAMIC
CF104	1-527-981-00	FILTER, CERAMIC

Ref.No.	Part No.	Description
IC101	8-759-801-81	IC LA1265
IC201	8-759-801-80	IC LA3401
IC301	8-759-207-45	IC TC9302AF-018
IC302	8-759-202-63	IC TC9172P

IFT101	1-404-659-11	COIL, DISCRIMINATOR
IFT102	1-404-713-11	TRANSFORMER, IF

L001	*1-422-336-11	COIL, AIR-CORE
L002	*1-422-040-00	COIL, AIR-CORE
L003	*1-422-081-00	COIL (WITH CORE)

L004	*1-422-039-00	COIL, AIR-CORE
L005	*1-459-396-00	COIL (WITH CORE)
L022	1-402-151-11	ANTENNA, FERRITE-ROD (LW/MW)

L023	1-406-089-11	COIL (OSC)
L025	1-406-207-11	COIL, LW (OSC)
L101	1-408-930-00	MICRO INDUCTOR 33MMH

L201	1-408-924-00	MICRO INDUCTOR 10MMH
L202	1-408-924-00	MICRO INDUCTOR 10MMH

LCD1	1-807-453-41	DISPLAY PANEL, LIQUID CRYSTAL
PL001	1-518-527-51	LAMP, PILOT
PL002	1-518-527-51	LAMP, PILOT

Q001	8-729-304-38	TRANSISTOR 2SC3391
Q002	8-729-304-38	TRANSISTOR 2SC3391
Q003	8-729-672-42	TRANSISTOR 2SC2724

Q004	8-729-672-42	TRANSISTOR 2SC2724
Q021	8-729-159-01	TRANSISTOR 2SA1348
Q022	8-729-115-33	TRANSISTOR BN1F4Z

Q005	8-729-159-01	TRANSISTOR 2SA1348
Q023	8-729-159-01	TRANSISTOR 2SA1348
Q024	8-729-115-33	TRANSISTOR BN1F4Z

Q006	8-729-115-33	TRANSISTOR BA1F4Z
Q025	8-729-115-33	TRANSISTOR BA1F4Z
Q026	8-729-115-93	TRANSISTOR BA1F4Z

Q007	8-729-115-79	TRANSISTOR BA1A4M
Q101	8-729-672-42	TRANSISTOR 2SC2724
Q201	8-729-115-79	TRANSISTOR BA1A4M

Q027	8-729-115-79	TRANSISTOR BA1A4M
Q301	8-729-600-27	TRANSISTOR 2SC634SP
Q302	8-729-600-27	TRANSISTOR 2SC634SP

Q028	8-729-115-79	TRANSISTOR BA1A4M
Q303	8-729-115-79	TRANSISTOR BA1A4M
Q304	8-729-159-01	TRANSISTOR 2SA1348

Q029	8-729-115-79	TRANSISTOR BA1A4M
Q301	8-729-600-27	TRANSISTOR 2SC634SP
Q302	8-729-600-27	TRANSISTOR 2SC634SP

Q030	8-729-115-79	TRANSISTOR BA1A4M
Q303	8-729-115-79	TRANSISTOR BA1A4M
Q304	8-729-159-01	TRANSISTOR 2SA1348

Q031	8-729-115-79	TRANSISTOR BA1A4M
Q305	8-729-159-01	TRANSISTOR 2SA1348
Q306	8-729-115-79	TRANSISTOR BA1A4M

Q032	8-729-115-79	TRANSISTOR BA1A4M
Q307	8-729-115-79	TRANSISTOR BA1A4M
Q308	8-729-115-79	TRANSISTOR BA1A4M

Q033	8-729-115-79	TRANSISTOR BA1A4M
Q309	8-729-201-56	TRANSISTOR 2SK246GR2
Q310	8-729-600-27	TRANSISTOR 2SC634SP

ELECTRICAL PARTS

Ref.No.	Part No.	Description	100K	5%	1/6W
R001	1-249-441-11	CARBON	100K	5%	1/6W
R002	1-215-491-00	CARBON	820K	5%	1/6W
R003	1-249-401-11	CARBON	47	5%	1/6W
R004	1-249-401-11	CARBON	47	5%	1/6W
R005	1-249-441-11	CARBON	100K	5%	1/6W
R006	1-215-491-00	CARBON	820K	5%	1/6W
R007	1-249-411-11	CARBON	330	5%	1/6W
R008	1-249-405-11	CARBON	100	5%	1/6W
R009	1-249-429-11	CARBON	10K	5%	1/6W
R010	1-249-429-11	CARBON	10K	5%	1/6W
R011	1-249-422-11	CARBON	2.7K	5%	1/6W
R012	1-249-431-11	CARBON	15K	5%	1/6W
R013	1-215-483-00	CARBON	390K	5%	1/6W
R014	1-249-405-11	CARBON	100	5%	1/6W
R021	1-249-429-11	CARBON	10K	5%	1/6W
R024	1-249-429-11	CARBON	10K	5%	1/6W
R025	1-249-429-11	CARBON	10K	5%	1/6W
R029	1-249-429-11	CARBON	10K	5%	1/6W
R030	1-249-429-11	CARBON	10K	5%	1/6W
R036	1-249-411-11	CARBON	330	5%	1/6W
R037	1-249-437-11	CARBON	47K	5%	1/6W
R038	1-215-493-00	CARBON	1M	5%	1/6W
R101	1-215-491-00	CARBON	820K	5%	1/6W
R102	1-249-411-11	CARBON	330	5%	1/6W
R103	1-249-434-11	CARBON	27K	5%	1/6W
R104	1-249-423-11	CARBON	3.3K	5%	1/6W
R105	1-247-849-00	CARBON	5.6K	5%	1/6W
R106	1-249-404-00	CARBON	82	5%	1/6W
R107	1-249-429-11	CARBON	10K	5%	1/6W
R108	1-249-429-11	CARBON	10K	5%	1/6W
R109	1-249-413-11	CARBON	470	5%	1/6W
R110	1-249-423-11	CARBON	3.3K	5%	1/6W
R201	1-249-423-11	CARBON	3.3K	5%	1/6W
R202	1-249-437-11	CARBON	47K	5%	1/6W
R203	1-249-437-11	CARBON	47K	5%	1/6W
R204	1-249-417-11	CARBON	1K	5%	1/6W
R205	1-249-437-11	CARBON	47K	5%	1/6W
R206	1-249-437-11	CARBON	47K	5%	1/6W
R207	1-249-437-11	CARBON	47K	5%	1/6W
R208	1-249-437-11	CARBON	47K	5%	1/6W
R209	1-249-419-11	CARBON	1.5K	5%	1/6W
R210	1-249-419-11	CARBON	1.5K	5%	1/6W
R211	1-249-429-11	CARBON	10K	5%	1/6W
R212	1-249-429-11	CARBON	10K	5%	1/6W
R220	1-249-452-11	CARBON	2.7	5%	1/4W
R302	1-249-419-11	CARBON	1.5K	5%	1/6W
R303	1-249-435-11	CARBON	33K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description	100K	5%	1/6W
R304	1-249-441-11	CARBON	100K	5%	1/6W
R305	1-249-435-11	CARBON	33K	5%	1/6W
R306	1-249-435-11	CARBON	33K	5%	1/6W
R307	1-249-423-11	CARBON	3.3K	5%	1/6W
R309	1-249-417-11	CARBON	1K	5%	1/6W
R310	1-249-405-11	CARBON	100	5%	1/6W
R311	1-249-405-11	CARBON	100	5%	1/6W
R312	1-249-437-11	CARBON	47K	5%	1/6W
R313	1-249-414-11	CARBON	560	5%	1/6W
R314	1-249-421-11	CARBON	2.2K	5%	1/6W
R315	1-249-435-11	CARBON	33K	5%	1/6W
R316	1-249-416-11	CARBON	820	5%	1/6W
R317	1-249-410-11	CARBON	270	5%	1/6W
R318	1-249-425-11	CARBON	4.7K	5%	1/6W
R319	1-249-425-11	CARBON	4.7K	5%	1/6W
R320	1-249-437-11	CARBON	47K	5%	1/6W
R321	1-247-885-00	CARBON	180K	5%	1/6W
R322	1-249-414-11	CARBON	560	5%	1/6W
R323	1-249-416-11	CARBON	820	5%	1/6W
R324	1-249-410-11	CARBON	270	5%	1/6W
R325	1-249-421-11	CARBON	2.2K	5%	1/6W
R326	1-249-425-11	CARBON	4.7K	5%	1/6W
R327	1-249-425-11	CARBON	4.7K	5%	1/6W
R001	1-501-270-00	ANTENNA, TELESCOPIC			
RT101	1-228-996-00	RES, ADJ, CARBON 47K			
RT102	1-230-629-11	RES, ADJ, CARBON 3.3K			
S301	1-554-303-21	SWITCH, KEY BOARD (1)			
S302	1-554-303-21	SWITCH, KEY BOARD (2)			
S303	1-554-303-21	SWITCH, KEY BOARD (3)			
S304	1-554-303-21	SWITCH, KEY BOARD (4)			
S305	1-554-303-21	SWITCH, KEY BOARD (5)			
S306	1-554-303-21	SWITCH, KEY BOARD (6)			
S307	1-554-303-21	SWITCH, KEY BOARD (7)			
S308	1-554-303-21	SWITCH, KEY BOARD (8)			
S309	1-554-303-21	SWITCH, KEY BOARD (9)			
S310	1-554-303-21	SWITCH, KEY BOARD (MEMORY)			
S311	1-554-303-21	SWITCH, KEY BOARD (0)			
S312	1-554-303-21	SWITCH, KEY BOARD (ENTER)			
S313	1-570-876-11	SWITCH, KEY BOARD (MEMORY SCAN)			
S314	1-570-876-11	SWITCH, KEY BOARD (+)			
S315	1-570-876-11	SWITCH, KEY BOARD (-)			
S316	1-570-876-11	SWITCH, KEY BOARD (BAND)			
S317	1-570-876-11	SWITCH, KEY BOARD (STEREO MUTING)			
TB001	1-536-708-00	TERMINAL BOARD, PUSH 4P			
X201	1-567-250-11	OSCILLATOR, CERAMIC (456kHz)			
X301	1-567-736-11	VIBRATOR, CRYSTAL (7.2MHz)			

ST-209

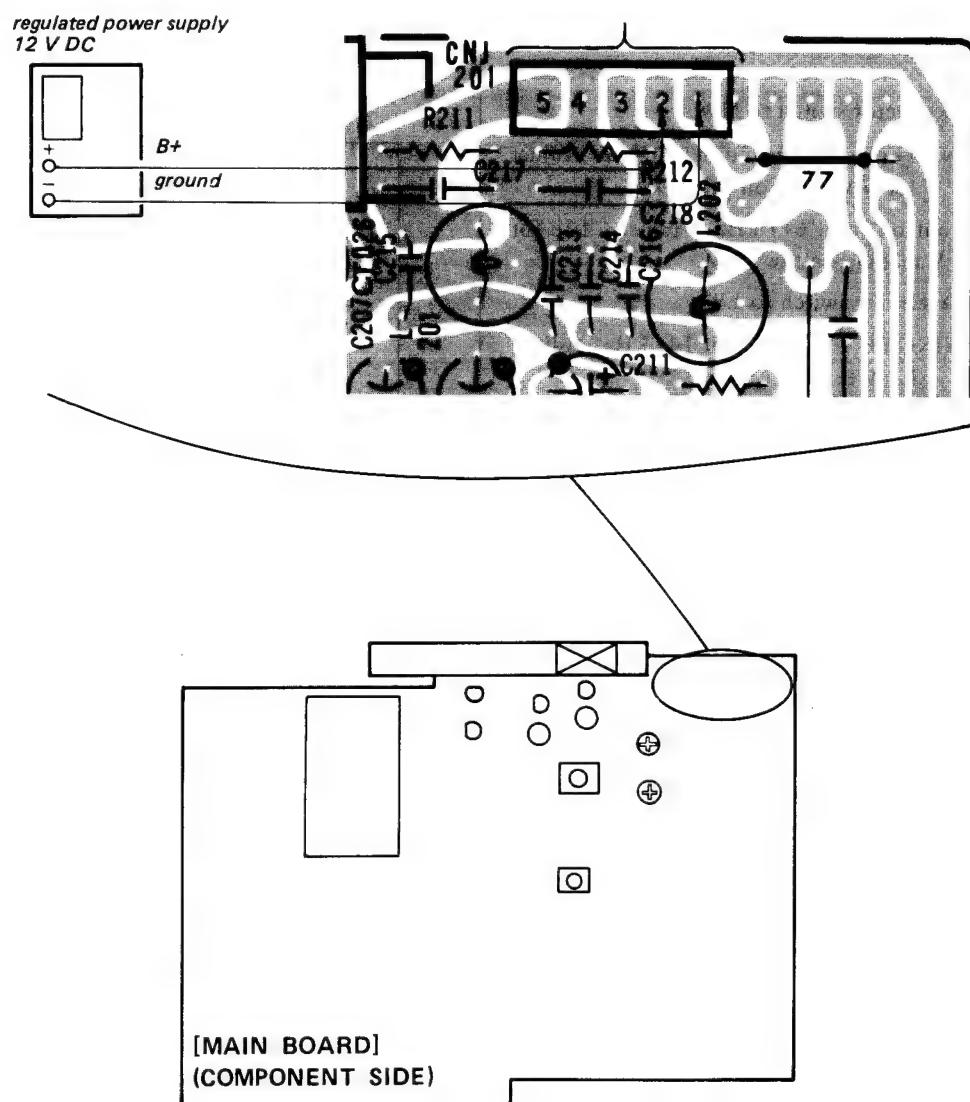
FH-204
FH-209WFM STEREO/FM-AM TUNER
〔ST-209〕

G-AEP Model

REPAIRING PRECAUTION

[To apply B+ voltage]

The power of this unit is fed from other unit.
 When the unit operates individually, connect the regulated power supply to the point as shown in the below fig.



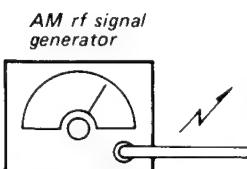
SECTION 1

ELECTRICAL ADJUSTMENTS

AM SECTION

Setting:

BAND selector switch: MW or LW



Put the lead-wire antenna close to the set.

30% amplitude modulation by 400 Hz signal

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

LW TRACKING ADJUSTMENT

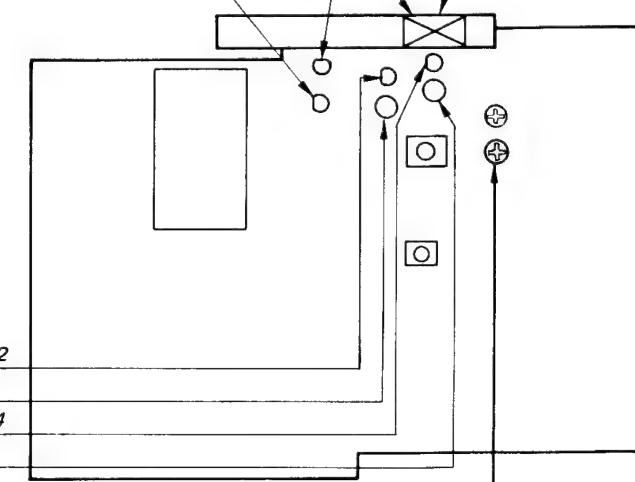
Adjust for a maximum reading on VTVM.

270 kHz	162 kHz
CT23	L22

MW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

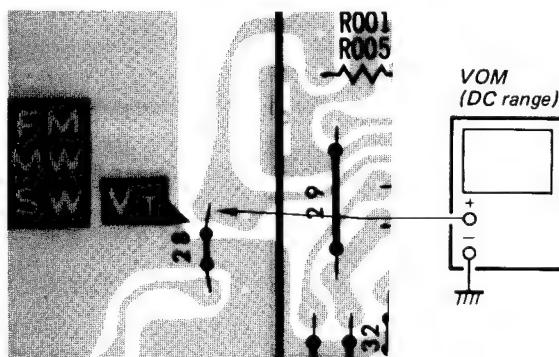
1,404 kHz	603 kHz
CT21	L22



MW/LW OSC Voltage Adjustment

Procedure:

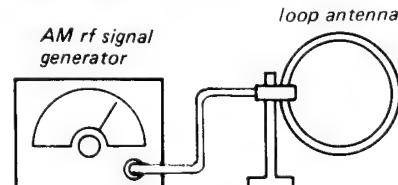
1. Set BAND selector switch to MW.
2. Push TUNING (+, -) button for 522 kHz. Adjust L23 for 1 – 1.1 V reading on the VOM.
3. Push the button for 1,611 kHz. Adjust CT22 for 8.0 – 8.5 V reading on the VOM.
4. Set BAND selector switch to LW.
5. Push TUNING (+, -) button for 144 kHz. Adjust L25 for 1 – 1.1 V reading on the VOM.
6. Push the button for 288 kHz. Adjust CT24 for 8.0 – 8.5 V reading on the VOM.



AM Tuned Indication Lighting Level Adjustment

BAND select switch: MW

Procedure:

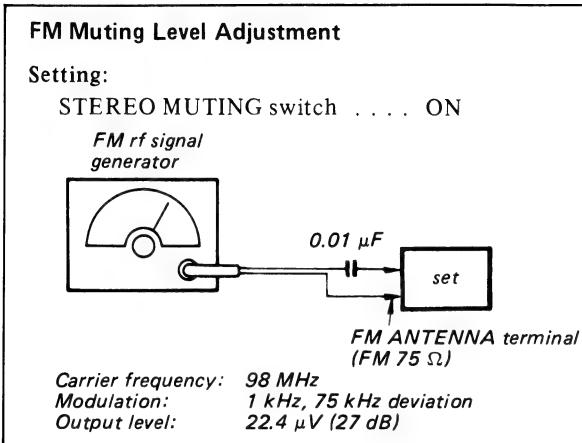


Carrier frequency: 999 kHz
Modulation: 400 Hz, 30% modulation

1. Set loop antenna so that the antenna input level becomes 0.7 mV/m (57 dB).
2. Adjust RT102 so that the LED lights up.

FM SECTION**Setting:**

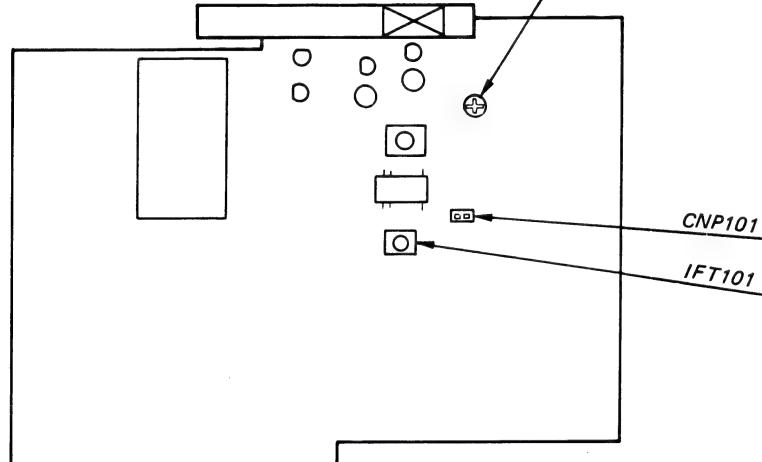
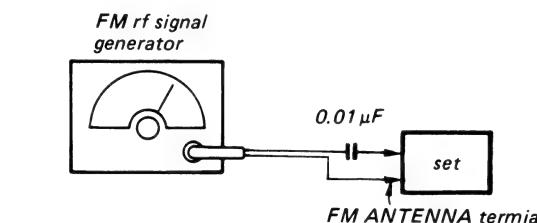
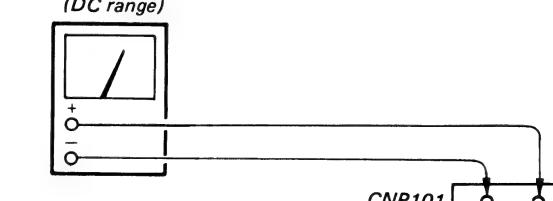
BAND selector switch FM

**Procedure:**

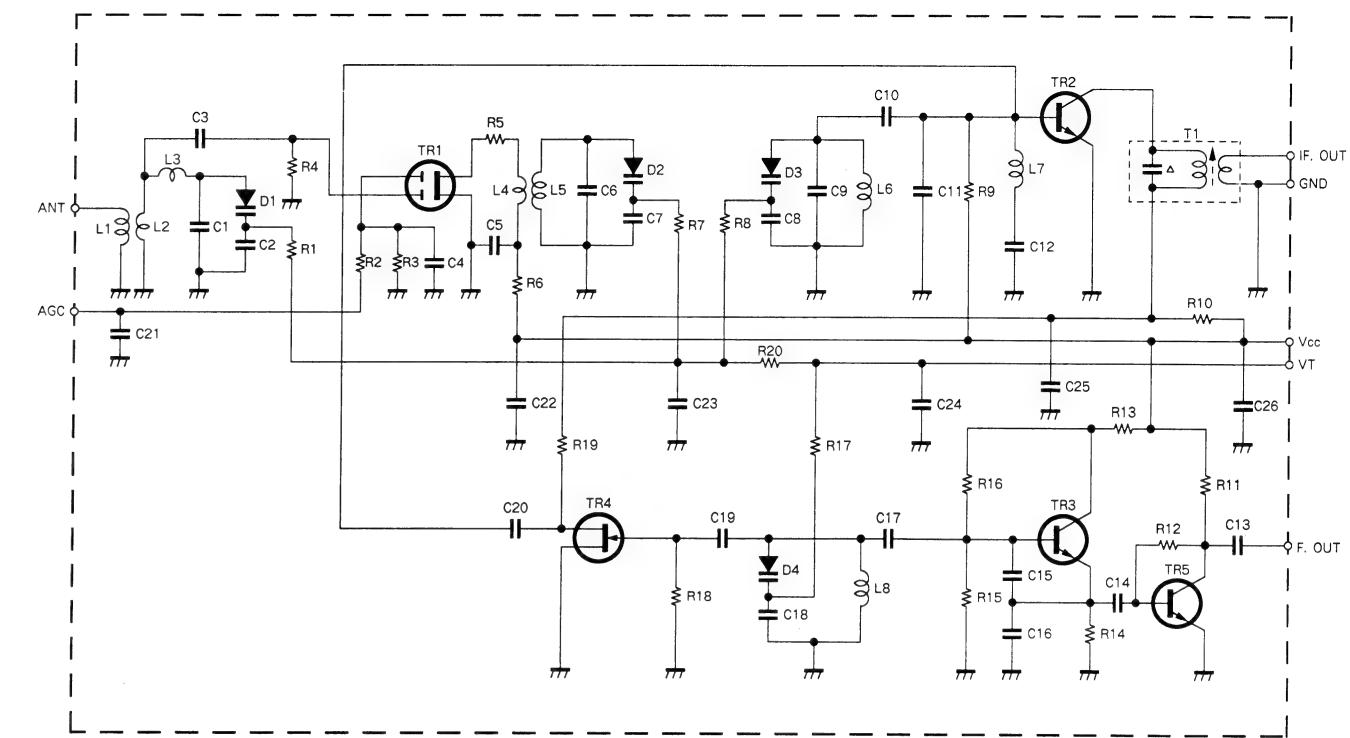
1. Check that "MUTING" is flashed on the indicator.
2. Push the TUNING (+, -) button for 98 MHz.
3. Adjust RT101, then check that "TUNED" is flashed on the indicator.

RT101

Note: FM discriminator alignment should be made after FM tracking adjustment.

**FM Discriminator Alignment (NULL Check)****Setting:***VOM (DC range)***Procedure:**

1. Push the TUNING (+, -) button for 98 MHz.
2. Adjust IFT101 for 0 V reading on the VOM.

• FM FRONT END (FE1) SCHEMATIC DIAGRAM

SECTION 2

DIAGRAMS

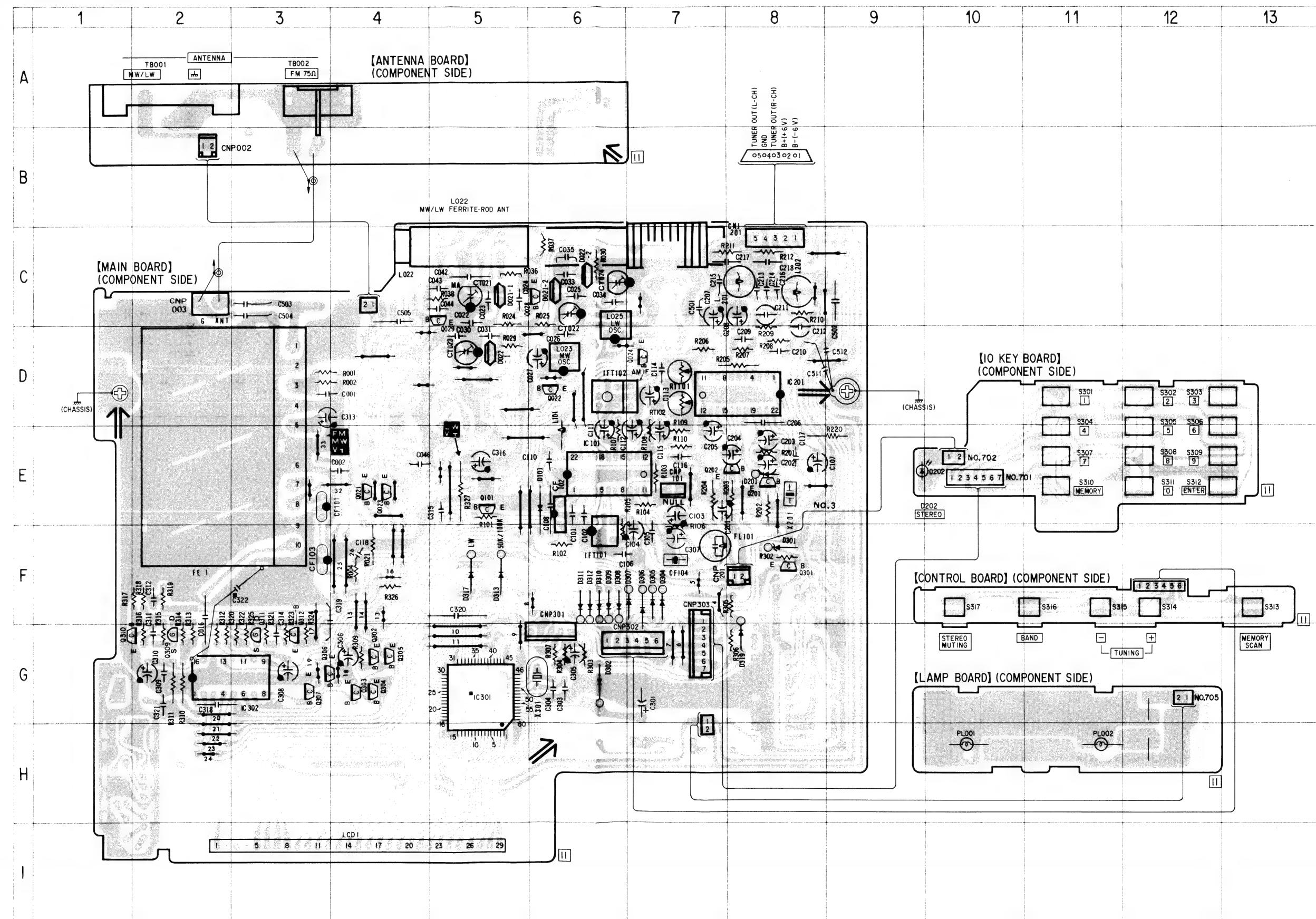
2-1. MOUNTING DIAGRAM

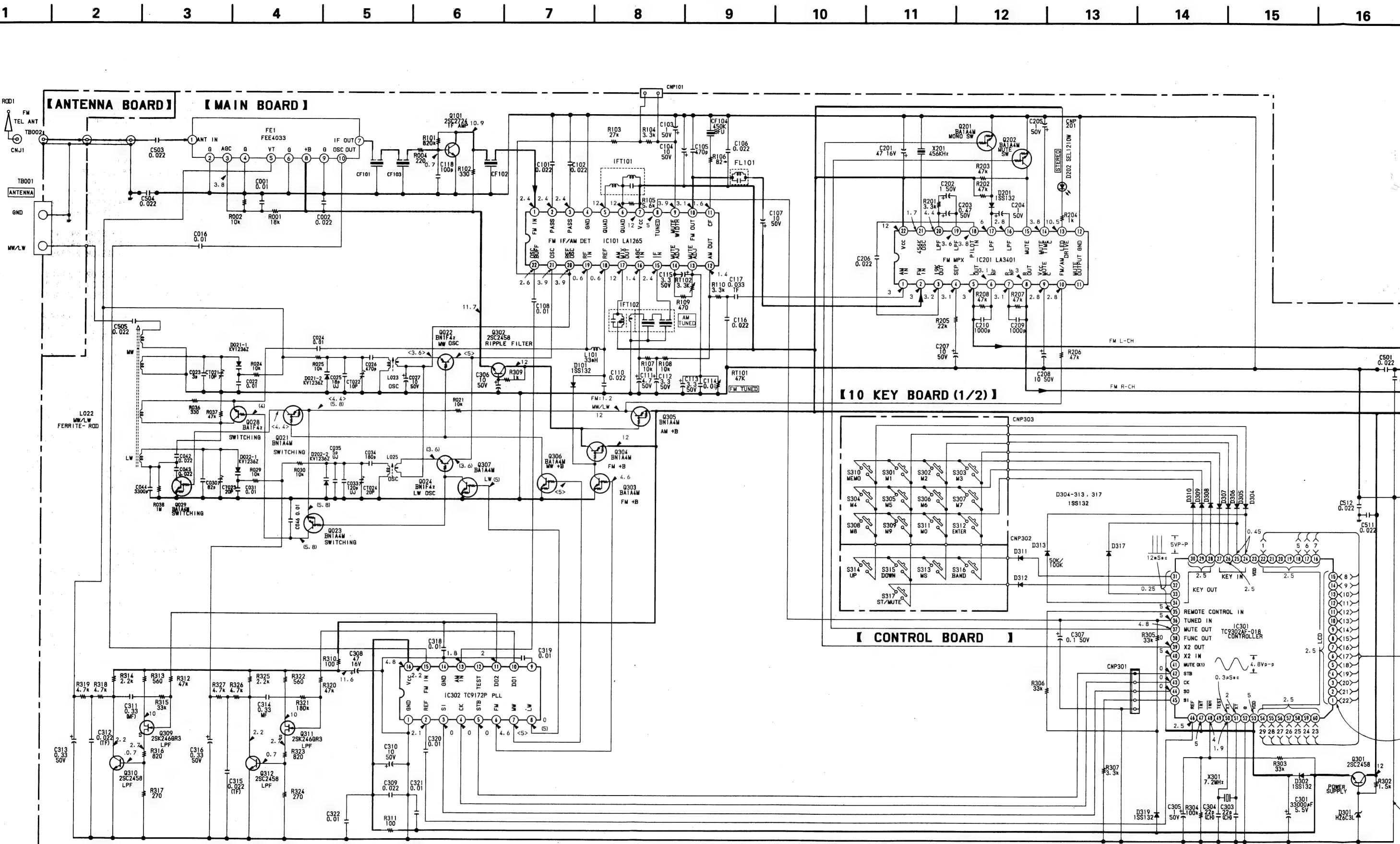
- See page ST-9 for Semiconductor Lead Layouts.

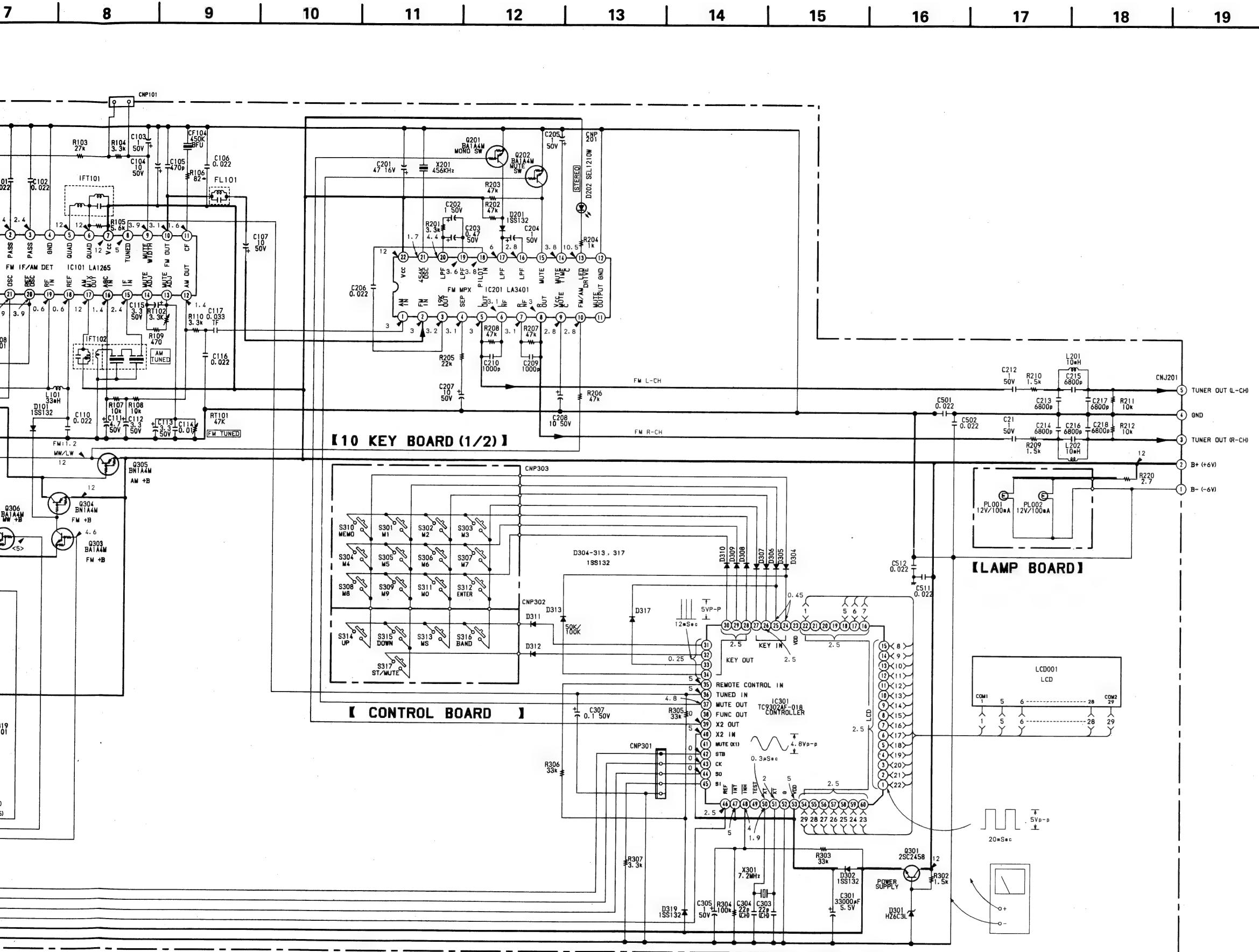
• SEMICONDUCTOR LOCATION

Ref. No.	Location
D021-1	C-5
D021-2	C-6
D022-1	D-5
D022-2	C-6
D101	E-6
D201	E-8
D202	E-9
D301	F-8
D302	G-6
D304	F-7
D305	F-7
D306	F-7
D307	F-7
D308	F-6
D309	F-6
D310	F-6
D311	F-6
D312	F-6
D313	F-5
D314	F-5
D315	F-5
D317	F-5
D319	G-8
IC101	E-6
IC201	E-6
IC301	G-5
IC302	G-2
Q021	E-4
Q022	D-6
Q023	E-4
Q024	D-7
Q028	C-6
Q029	D-5
Q101	E-4
Q201	E-8
Q202	E-8
Q301	F-8
Q302	G-4
Q303	G-4
Q304	G-4
Q305	G-4
Q306	G-3
Q307	G-3
Q309	G-2
Q310	G-1
Q311	G-3
Q312	G-3

Note:
■ : part mounted on
the conductor side.







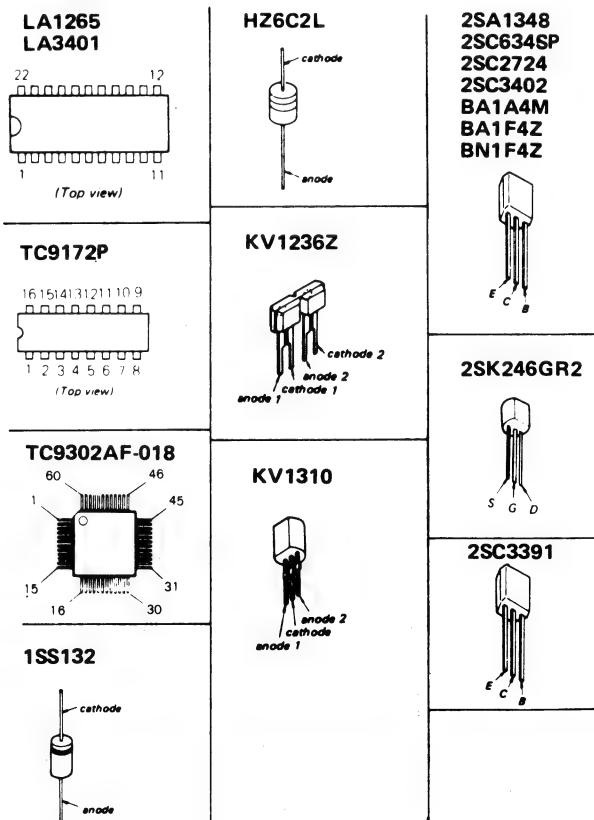
Note:

- All capacitors are in μ F unless otherwise noted. pF: $\mu\mu$ F. 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}$ W or less unless otherwise specified.
- signal path.
- B+ bus.
- B- bus.
- adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 k Ω /V).
- no mark: FM mode
- < >: MW mode
- (): LW mode

Switch

Ref. No.	Switch	Position
S301		1
S302		2
S303		3
S304		4
S305		5
S306		6
S307		7
S308		8
S309		9
S310	MEMORY	
S311	0	
S312	ENTER	
S313	MEMORY SCAN	
S314	+	
S315	-	
S316	BAND	
S317	STEREO MUTING	

● Semiconductor Lead Layouts



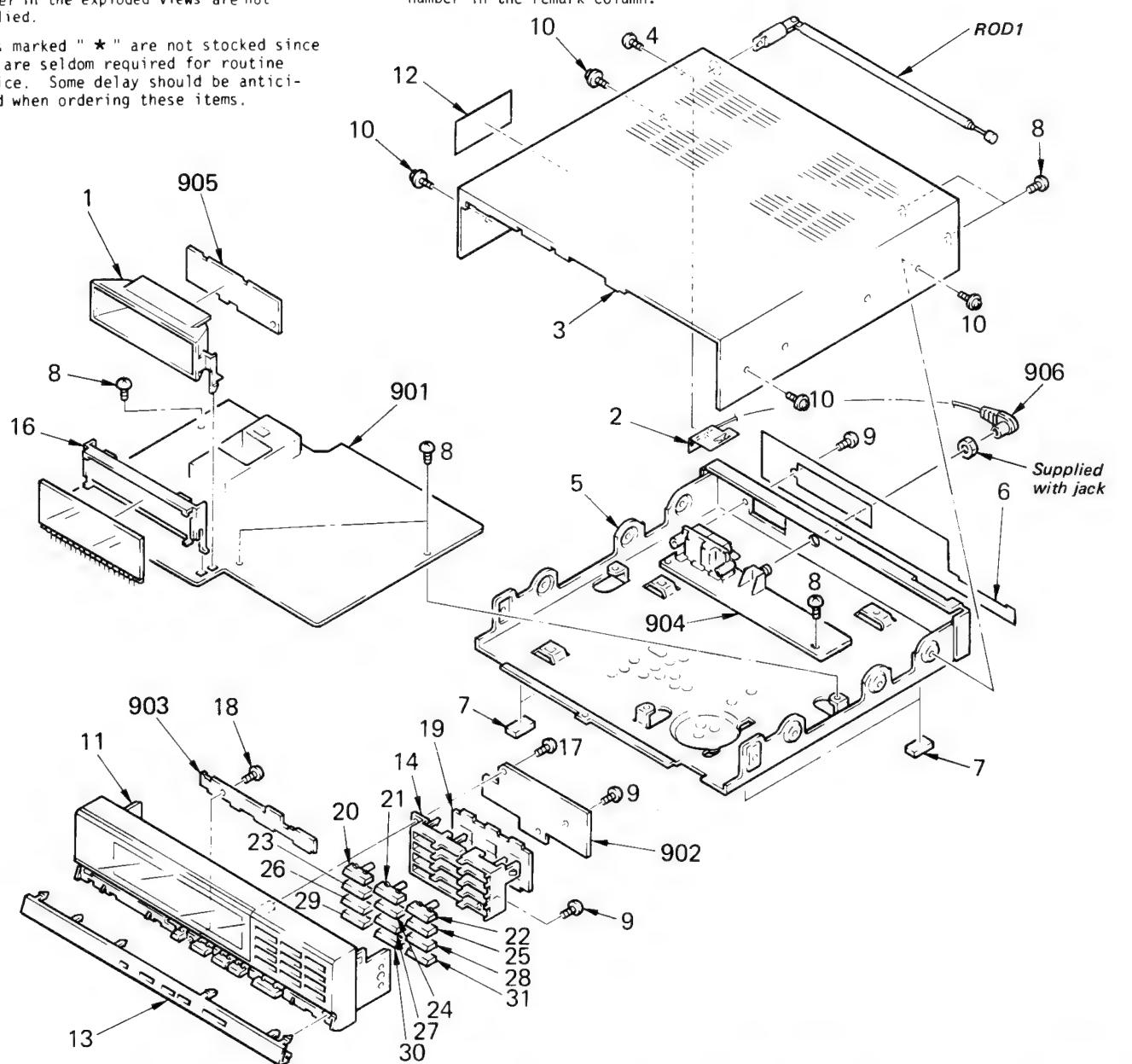
SECTION 3

EXPLODED VIEW AND PARTS LIST

NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The construction parts of an assembled part are indicated with a callout number in the remark column.



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	*4-917-275-01	HOUSE, LAMP		20	4-920-176-01	BUTTON (1)	
2	*4-919-611-01	BRACKET, ANT		21	4-920-176-11	BUTTON (2)	
3	4-920-137-01	CASE		22	4-920-176-21	BUTTON (3)	
4	7-682-547-09	SCREW +B 3X6		23	4-920-176-31	BUTTON (4)	
5	*4-919-617-11	CHASSIS		24	4-920-176-41	BUTTON (5)	
6	*4-919-606-11	COVER, REAR		25	4-920-176-51	BUTTON (6)	
7	4-919-608-01	FOOT		26	4-920-176-61	BUTTON (7)	
8	7-682-147-01	SCREW +BVTT 3X6 (S)		27	4-920-176-71	BUTTON (8)	
9	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		28	4-920-176-81	BUTTON (9)	
10	4-886-821-21	SCREW, M3 CASE STOPPER		29	4-920-175-01	BUTTON (MEMORY)	
11	X-4919-627-1	PANEL ASSY		30	4-920-176-91	BUTTON (0)	
12	4-919-666-01	LABEL, MODEL NUMBER (AE4)		31	4-920-175-11	BUTTON (ENTERO)	
13	4-919-616-02	PANEL, CONTROL		901	*A-4351-587-A	MONTE PCB, TUNER	
14	*4-919-614-01	RETAINER, BUTTON		902	*1-622-320-11	PC BOARD, 10 KEY	
16	*4-909-633-01	ILLUMINATOR		903	*1-622-321-11	PC BOARD, CONTROL	
17	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S		904	*1-622-322-11	PC BOARD, ANTENNA	
18	7-685-133-19	SCREW +P 2.6X6 TYPE2 SLIT		905	*1-622-323-11	PC BOARD, LAMP	
19	*4-919-607-01	SPACER		906	*1-562-908-11	CONNECTOR, FEMALE (NO SHIELD)	
				901	1-501-270-00	ANTENNA, TELESCOPIC	

SECTION 4

ELECTRICAL PARTS LIST

NOTE:

Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:LF, PF:μF.

RESISTORS:
All resistors are in ohms.
F: nonflammable

COILS:
MH: mH, UH: μH

SEMICONDUCTORS:
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

CNP002*1-5
CNP003*1-5
CNP101*1-5
CNP201*1-5
CNP301*1-5
CNP302*1-5
CNP303*1-5

CT021 1-1
CT022 1-1
CT023 1-1
CT024 1-1

D021 8-7
D022 8-7
D101 8-7

D201 8-7
D202 8-7
D301 8-7

D302 8-7
D304 8-7
D305 8-7

D306 8-7
D307 8-7
D308 8-7

D309 8-7
D310 8-7
D311 8-7

D312 8-7
D313 8-7
D314 8-7

FE1 1-4

FL101 1-2

IC101 8-7
IC201 8-7

IC301 8-7
IC302 8-7

IFT101 1-4
IFT102 1-4

L022 1-4
L023 1-4
L025 1-4

ELECTRICAL PARTS			ELECTRICAL PARTS								
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description						
901	*A-4351-587-A	MONTE PCB, TUNER	C206	1-161-494-00	CERAMIC	0.022MF	30%	25V			
902	*1-622-320-11	PC BOARD, 10 KEY	C207	1-123-875-91	ELECT	10MF	20%	50V			
903	*1-622-321-11	PC BOARD, CONTROL	C208	1-123-875-91	ELECT	10MF	20%	50V			
904	*1-622-322-11	PC BOARD, ANTENNA	C209	1-102-074-00	CERAMIC	0.001MF	10%	50V			
905	*1-622-323-11	PC BOARD, LAMP	C210	1-102-074-00	CERAMIC	0.001MF	10%	50V			
906	*1-562-908-11	CONNECTOR, FEMALE (NO SHIELD)	C211	1-124-611-00	ELECT	1MF	20%	50V			
CO01	1-161-379-00	CERAMIC	0.01MF	20%	16V	C212	1-124-611-00	ELECT	1MF	20%	50V
CO02	1-101-005-00	CERAMIC	0.022MF	50V	C213	1-161-329-00	CERAMIC	0.0068MF	20%	16V	
CO16	1-161-379-00	CERAMIC	0.01MF	20%	16V	C214	1-161-329-00	CERAMIC	0.0068MF	20%	16V
CO22	1-161-379-00	CERAMIC	0.01MF	20%	16V	C215	1-161-329-00	CERAMIC	0.0068MF	20%	16V
CO23	1-102-936-00	CERAMIC	3PF	0.25PF	50V	C216	1-161-329-00	CERAMIC	0.0068MF	20%	16V
CO24	1-161-379-00	CERAMIC	0.01MF	20%	16V	C217	1-161-329-00	CERAMIC	0.0068MF	20%	16V
CO25	1-102-893-00	CERAMIC	18PF	5%	50V	C218	1-161-329-00	CERAMIC	0.0068MF	20%	16V
CO26	1-130-014-00	FILM	470PF	5%	50V	C301	1-126-211-51	ELECT	33000MF	5.5V	
CO27	1-123-875-91	ELECT	10MF	20%	50V	C303	1-102-959-00	CERAMIC	22PF	5%	50V
CO30	1-102-971-00	CERAMIC	82PF	5%	50V	C304	1-102-959-00	CERAMIC	22PF	5%	50V
CO31	1-161-379-00	CERAMIC	0.01MF	20%	16V	C305	1-124-499-11	ELECT	1MF	20%	50V
CO33	1-102-816-00	CERAMIC	120PF	5%	50V	C306	1-123-875-91	ELECT	10MF	20%	50V
CO34	1-130-047-00	FILM	180PF	5%	50V	C307	1-124-463-00	ELECT	0.1MF	20%	50V
CO35	1-102-942-00	CERAMIC	5PF	0.5PF	50V	C308	1-124-477-11	ELECT	47MF	20%	16V
CO42	1-161-494-00	CERAMIC	0.022MF	30%	25V	C309	1-101-005-00	CERAMIC	0.022MF	20%	50V
CO43	1-101-005-00	CERAMIC	0.022MF	50V	C310	1-123-875-91	ELECT	10MF	20%	50V	
CO44	1-161-327-00	CERAMIC	0.0033MF	20%	16V	C311	1-136-171-00	FILM	0.33MF	5%	50V
CO46	1-161-379-00	CERAMIC	0.01MF	20%	16V	C312	1-130-487-00	MYLAR	0.022MF	5%	50V
C101	1-101-005-00	CERAMIC	0.022MF	50V	C313	1-124-252-00	ELECT	0.33MF	20%	50V	
C102	1-101-005-00	CERAMIC	0.022MF	50V	C314	1-136-171-00	FILM	0.33MF	5%	50V	
C103	1-124-499-11	ELECT	1MF	20%	50V	C315	1-130-487-00	MYLAR	0.022MF	5%	50V
C104	1-123-875-91	ELECT	10MF	20%	50V	C316	1-124-252-00	ELECT	0.33MF	20%	50V
C105	1-162-290-31	CERAMIC	470PF	10%	50V	C318	1-161-379-00	CERAMIC	0.01MF	20%	16V
C106	1-101-005-00	CERAMIC	0.022MF	50V	C319	1-161-379-00	CERAMIC	0.01MF	20%	16V	
C107	1-123-875-91	ELECT	10MF	20%	50V	C320	1-161-379-00	CERAMIC	0.01MF	20%	16V
C108	1-161-379-00	CERAMIC	0.01MF	20%	16V	C321	1-161-379-00	CERAMIC	0.01MF	20%	16V
C110	1-101-005-00	CERAMIC	0.022MF	50V	C322	1-161-379-00	CERAMIC	0.01MF	20%	16V	
C111	1-124-927-11	ELECT	4.7MF	20%	50V	C501					

SECTION 4
ELECTRICAL PARTS LIST

NOTE:

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If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μ F, PF: μ F.

RESISTORS:
All resistors are in ohms.
F: nonflammable

COILS:
MMH: mH, UH: μ H

SEMICONDUCTORS
In each case, U: μ , for example:
UA...: μ A..., UPA...: μ PA..., UPC...: μ PC,
UPD...: μ PD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description
	CNP002*1-564-336-00	PIN, CONNECTOR 2P
	CNP003*1-535-115-00	TERMINAL
	CNP101*1-560-060-00	PIN, CONNECTOR 2P
	CNP201*1-564-336-00	PIN, CONNECTOR 2P
	CNP301*1-560-063-00	PIN, CONNECTOR 5P
	CNP302*1-560-064-00	PIN, CONNECTOR 6P
	CNP303*1-564-341-11	PIN, CONNECTOR 7P

Ref.No.	Part No.	Description
L101	1-408-930-00	MICRO INDUCTOR 33MMH
L201	1-408-924-00	MICRO INDUCTOR 10MMH
L202	1-408-924-00	MICRO INDUCTOR 10MMH
LCD1	1-807-453-41	DISPLAY PANEL, LIQUID CRYSTAL
PL001	1-518-527-51	LAMP, PILOT
PL002	1-518-527-51	LAMP, PILOT
Q021	9-986-159-01	TRANSISTOR 2SA1348
Q022	8-729-115-33	TRANSISTOR BN1F4Z
Q023	9-986-159-01	TRANSISTOR 2SA1348
Q024	8-729-115-33	TRANSISTOR BN1F4Z
Q028	8-729-115-93	TRANSISTOR BA1F4Z
Q029	8-729-806-28	TRANSISTOR 2SC3402
Q101	8-729-672-42	TRANSISTOR 2SC2724
Q201	8-729-806-28	TRANSISTOR 2SC3402
Q202	8-729-806-28	TRANSISTOR 2SC3402
Q301	8-729-600-27	TRANSISTOR 2SC634SP
Q302	8-729-600-27	TRANSISTOR 2SC634PS
Q303	8-729-806-28	TRANSISTOR 2SC3402
Q304	9-986-159-01	TRANSISTOR 2SA1348
Q305	9-986-159-01	TRANSISTOR 2SA1348
Q306	8-729-806-28	TRANSISTOR 2SC3402
Q307	8-729-806-28	TRANSISTOR 2SC3402
Q309	8-729-201-56	TRANSISTOR 2SK246GR2
Q310	8-729-600-27	TRANSISTOR 2SC634SP
Q311	8-729-201-56	TRANSISTOR 2SK246GR2
Q312	8-729-600-27	TRANSISTOR 2SC634SP
R001	1-249-432-11	CARBON 18K 5% 1/4W
R002	1-249-429-11	CARBON 10K 5% 1/4W
R004	1-249-409-11	CARBON 220 5% 1/4W
R021	1-249-429-11	CARBON 10K 5% 1/4W
R024	1-249-429-11	CARBON 10K 5% 1/4W
R025	1-249-429-11	CARBON 10K 5% 1/4W
R029	1-249-429-11	CARBON 10K 5% 1/4W
R030	1-249-429-11	CARBON 10K 5% 1/4W
R036	1-249-411-11	CARBON 330 5% 1/4W
R037	1-249-437-11	CARBON 47K 5% 1/4W
R038	1-215-493-00	CARBON 1M 5% 1/4W
R101	1-215-491-00	CARBON 820K 5% 1/4W
R102	1-249-411-11	CARBON 330 5% 1/4W
R103	1-249-434-11	CARBON 27K 5% 1/4W
R104	1-249-423-11	CARBON 3.3K 5% 1/4W
R105	1-247-849-00	CARBON 5.6K 5% 1/4W
R106	1-249-404-00	CARBON 82 5% 1/4W
R107	1-249-429-11	CARBON 10K 5% 1/4W

ELECTRICAL PARTS								
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
901	*A-4351-587-A	_MOUNTED PCB, TUNER	C206	1-161-494-00	CERAMIC 0.022MF 30% 25V	CT021	1-141-227-00	CAP, CERAMIC TRIMMER
902	*1-622-320-11	PC BOARD, 10 KEY	C207	1-123-875-91	ELECT 10MF 20% 50V	CT022	1-141-304-21	TRIMMER, CERAMIC
903	*1-622-321-11	PC BOARD, CONTROL	C208	1-123-875-91	ELECT 10MF 20% 50V	CT023	1-141-227-00	CAP, CERAMIC TRIMMER
904	*1-622-322-11	PC BOARD, ANTENNA	C209	1-102-074-00	CERAMIC 0.001MF 10% 50V	CT024	1-141-227-00	CAP, CERAMIC TRIMMER
905	*1-622-323-11	PC BOARD, LAMP	C210	1-102-074-00	CERAMIC 0.001MF 10% 50V	D021	8-719-902-79	DIODE KV1236Z
906	*1-562-908-11	CONNECTOR, FEMALE (NO SHIELD)	C211	1-124-611-00	ELECT 1MF 20% 50V	D022	8-719-902-79	DIODE KV1236Z
C001	1-161-379-00	CERAMIC 0.01MF 20% 16V	C212	1-124-611-00	ELECT 1MF 20% 50V	D101	8-719-940-76	DIODE ISS132
C002	1-101-005-00	CERAMIC 0.022MF 50V	C213	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D201	8-719-940-76	DIODE ISS132
C016	1-161-379-00	CERAMIC 0.01MF 20% 16V	C214	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D202	8-719-303-13	DIODE SEL1210W
C022	1-161-379-00	CERAMIC 0.01MF 20% 16V	C215	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D301	8-719-910-63	DIODE HZ6C2L
C023	1-102-936-00	CERAMIC 3PF 0.25PF 50V	C216	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D306	8-719-940-76	DIODE ISS132
C024	1-161-379-00	CERAMIC 0.01MF 20% 16V	C217	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D307	8-719-940-76	DIODE ISS132
C025	1-102-893-00	CERAMIC 18PF 5% 50V	C218	1-161-329-00	CERAMIC 0.0068MF 20% 16V	D308	8-719-940-76	DIODE ISS132
C026	1-130-014-00	FILM 470PF 5% 50V	C301	1-126-211-51	ELECT 33000MF 5.5V	D309	8-719-940-76	DIODE ISS132
C027	1-123-875-91	ELECT 10MF 20% 50V	C303	1-102-959-00	CERAMIC 22PF 5% 50V	D310	8-719-940-76	DIODE ISS132
C030	1-102-971-00	CERAMIC 82PF 5% 50V	C304	1-102-959-00	CERAMIC 22PF 5% 50V	D311	8-719-940-76	DIODE ISS132
C031	1-161-379-00	CERAMIC 0.01MF 20% 16V	C305	1-124-499-11	ELECT 1MF 20% 50V	D312	8-719-940-76	DIODE ISS132
C033	1-102-816-00	CERAMIC 120PF 5% 50V	C306	1-123-875-91	ELECT 10MF 20% 50V	D313	8-719-940-76	DIODE ISS132
C034	1-130-047-00	FILM 180PF 5% 50V	C307	1-124-463-00	ELECT 0.1MF 20% 50V	D314	8-719-940-76	DIODE ISS132
C035	1-102-942-00	CERAMIC 5PF 0.5PF 50V	C308	1-124-477-11	ELECT 47MF 20% 16V	D315	8-719-940-76	DIODE ISS132
C042	1-161-494-00	CERAMIC 0.022MF 30% 25V	C309	1-101-005-00	CERAMIC 0.022MF 50V	D317	8-719-940-76	DIODE ISS132
C043	1-101-005-00	CERAMIC 0.022MF 50V	C310	1-123-875-91	ELECT 10MF 20% 50V	D319	8-719-940-76	DIODE ISS132
C044	1-161-327-00	CERAMIC 0.0033MF 20% 16V	C311	1-136-171-00	FILM 0.33MF 5% 50V	FE1	1-463-857-11	FRONT END (FM)
C046	1-161-379-00	CERAMIC 0.01MF 20% 16V	C312	1-130-487-00	MYLAR 0.022MF 5% 50V	FL101	1-235-126-00	ENCAPSULATED COMPONENT
C101	1-101-005-00	CERAMIC 0.022MF 50V	C313	1-124-252-00	ELECT 0.33MF 20% 50V	R029	1-249-429-11	CARBON 10K 5% 1/4W
C102	1-101-005-00	CERAMIC 0.022MF 50V	C314	1-136-171-00	FILM 0.33MF 5% 50V	R030	1-249-429-11	CARBON 10K 5% 1/4W
C103	1-124-499-11	ELECT 1MF 20% 50V	C315	1-130-487-00	MYLAR 0.022MF 5% 50V	R036	1-249-411-11	CARBON 330 5% 1/4W
C104	1-123-875-91	ELECT 10MF 20% 50V	C316	1-124-252-00	ELECT 0.33MF 20% 50V	R037	1-249-437-11	CARBON 47K 5% 1/4W
C105	1-162-290-31	CERAMIC 470PF 10% 50V	C318	1-161-379-00	CERAMIC 0.01MF 20% 16V	R038	1-215-493-00	CARBON 1M 5% 1/4W
C106	1-101-005-00	CERAMIC 0.022MF 50V	C319	1-161-379-00	CERAMIC 0.01MF 20% 16V	R101	1-215-491-00	CARBON 820K 5% 1/4W
C107	1-123-875-91							

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R108	1-249-429-11	CARBON	10K	5%	1/4W
R109	1-249-413-11	CARBON	470	5%	1/4W
R110	1-249-423-11	CARBON	3.3K	5%	1/4W
R201	1-249-423-11	CARBON	3.3K	5%	1/4W
R202	1-249-437-11	CARBON	47K	5%	1/4W
R203	1-249-437-11	CARBON	47K	5%	1/4W
R204	1-249-417-11	CARBON	1K	5%	1/4W
R205	1-249-434-11	CARBON	27K	5%	1/4W
R206	1-249-437-11	CARBON	47K	5%	1/4W
R207	1-249-437-11	CARBON	47K	5%	1/4W
R208	1-249-437-11	CARBON	47K	5%	1/4W
R209	1-249-419-11	CARBON	1.5K	5%	1/4W
R210	1-249-419-11	CARBON	1.5K	5%	1/4W
R220	1-249-452-11	CARBON	2.7	5%	1/4W
R302	1-249-419-11	CARBON	1.5K	5%	1/4W
R303	1-249-435-11	CARBON	33K	5%	1/4W
R304	1-249-441-11	CARBON	100K	5%	1/4W
R305	1-249-435-11	CARBON	33K	5%	1/4W
R306	1-249-435-11	CARBON	33K	5%	1/4W
R307	1-249-423-11	CARBON	3.3K	5%	1/4W
R309	1-249-417-11	CARBON	1K	5%	1/4W
R310	1-249-405-11	CARBON	100	5%	1/4W
R311	1-249-405-11	CARBON	100	5%	1/4W
R312	1-249-437-11	CARBON	47K	5%	1/4W
R313	1-249-414-11	CARBON	560	5%	1/4W
R314	1-249-421-11	CARBON	2.2K	5%	1/4W
R315	1-249-435-11	CARBON	33K	5%	1/4W
R316	1-249-416-11	CARBON	820	5%	1/4W
R317	1-249-410-11	CARBON	270	5%	1/4W
R318	1-249-425-11	CARBON	4.7K	5%	1/4W
R319	1-249-425-11	CARBON	4.7K	5%	1/4W
R320	1-249-437-11	CARBON	47K	5%	1/4W
R321	1-247-885-00	CARBON	180K	5%	1/4W
R322	1-249-414-11	CARBON	560	5%	1/4W
R323	1-249-416-11	CARBON	820	5%	1/4W
R324	1-249-410-11	CARBON	270	5%	1/4W
R325	1-249-421-11	CARBON	2.2K	5%	1/4W
R326	1-249-425-11	CARBON	4.7K	5%	1/4W
R327	1-249-425-11	CARBON	4.7K	5%	1/4W
ROD1	1-501-270-00	ANTENNA, TELESCOPIC			
RT101	1-228-996-00	RES, ADJ, CARBON	47K		
RT102	1-228-992-11	RES, ADJ, CARBON	3.3K		

ELECTRICAL PARTS

Ref.No.	Part No.	Description
S301	1-554-303-21	SWITCH, KEY BOARD (1)
S302	1-554-303-21	SWITCH, KEY BOARD (2)
S303	1-554-303-21	SWITCH, KEY BOARD (3)
S304	1-554-303-21	SWITCH, KEY BOARD (4)
S305	1-554-303-21	SWITCH, KEY BOARD (5)
S306	1-554-303-21	SWITCH, KEY BOARD (6)
S307	1-554-303-21	SWITCH, KEY BOARD (7)
S308	1-554-303-21	SWITCH, KEY BOARD (8)
S309	1-554-303-21	SWITCH, KEY BOARD (9)
S310	1-554-303-21	SWITCH, KEY BOARD (MEMORY)
S311	1-554-303-21	SWITCH, KEY BOARD (0)
S312	1-554-303-21	SWITCH, KEY BOARD (ENTER)
S313	1-570-876-11	SWITCH, KEY BOARD (MEMORY)
S314	1-570-876-11	SWITCH, KEY BOARD (+)
S315	1-570-876-11	SWITCH, KEY BOARD (-)
S316	1-570-876-11	SWITCH, KEY BOARD (BAND)
S317	1-570-876-11	SWITCH, KEY BOARD (STEREO MUTING)
TB001	1-536-707-00	TERMINAL BOARD, PUSH 2P
TB002	1-563-199-11	CONNECTOR, PAL
X201	1-567-250-11	OSCILLATOR, CERAMIC
X301	1-567-736-11	VIBRATOR, CRYSTAL

ST-209

STEREO CASSETTE DECK AMPLIFIER [DXA-209W]

US Model
Canadian Model
AEP Model
UK Model

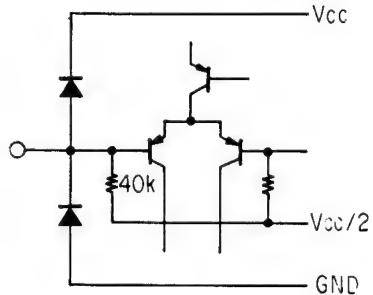
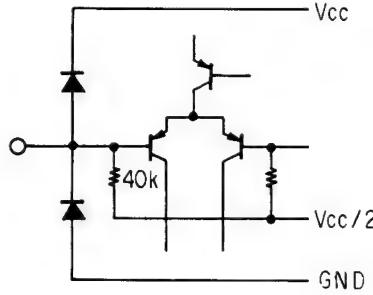
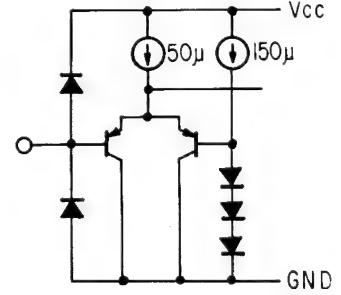
SECTION 1 OUTLINE

1-1. ON THE NEW DOLBY-B NOISE-REDUCTION IC CXA1101P/M (IC303)

The CX1101P/M is a new IC incorporating 2-channel Dolby-B type noise-reducing processor built into one chip. By developing this IC, these many components outside this kind of IC have been extensively eliminated. This IC is made available by building filter circuits on the chip by utilizing thin-film capacitors which have very-large capacitances per unit space, and this is a silicon-monolithic IC.

1) Descriptions On Pins and Equivalent Circuits:

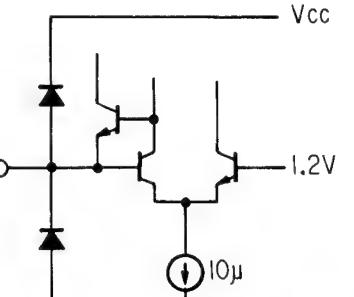
T_a = 25°C, V_{cc} = 12V (single-ended), without signals:

PIN Nr.	PIN NAMING	Z (in)	VDC	EQUIVALENT CIRCUIT	FUNCTION
1, 16	REC IN	40 kΩ	6.0V		Recording (encoding) input terminals
2	V _{cc}	-	12.0V		Power-supply input terminal
3, 14	PB IN	40 kΩ	6.0V		Playback (decoding) input terminals
4	V _{cc} /2	1 kΩ	6.0V		Used as the V _{cc} /2 terminal when single-voltage power supply is used. Used as the grounding terminal when two power-supply voltages of positive and negative are used.
5	ON/OFF	-	-		Noise reduction ON/OFF terminal. ON: "L" (low) state OFF: "H" (high) state

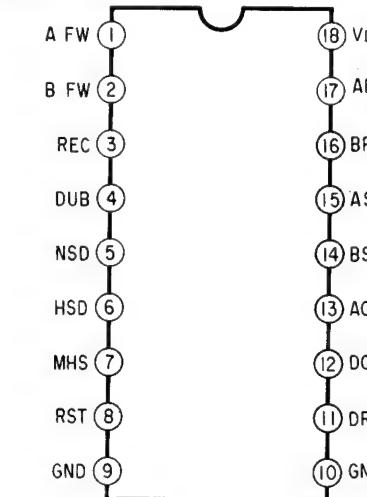
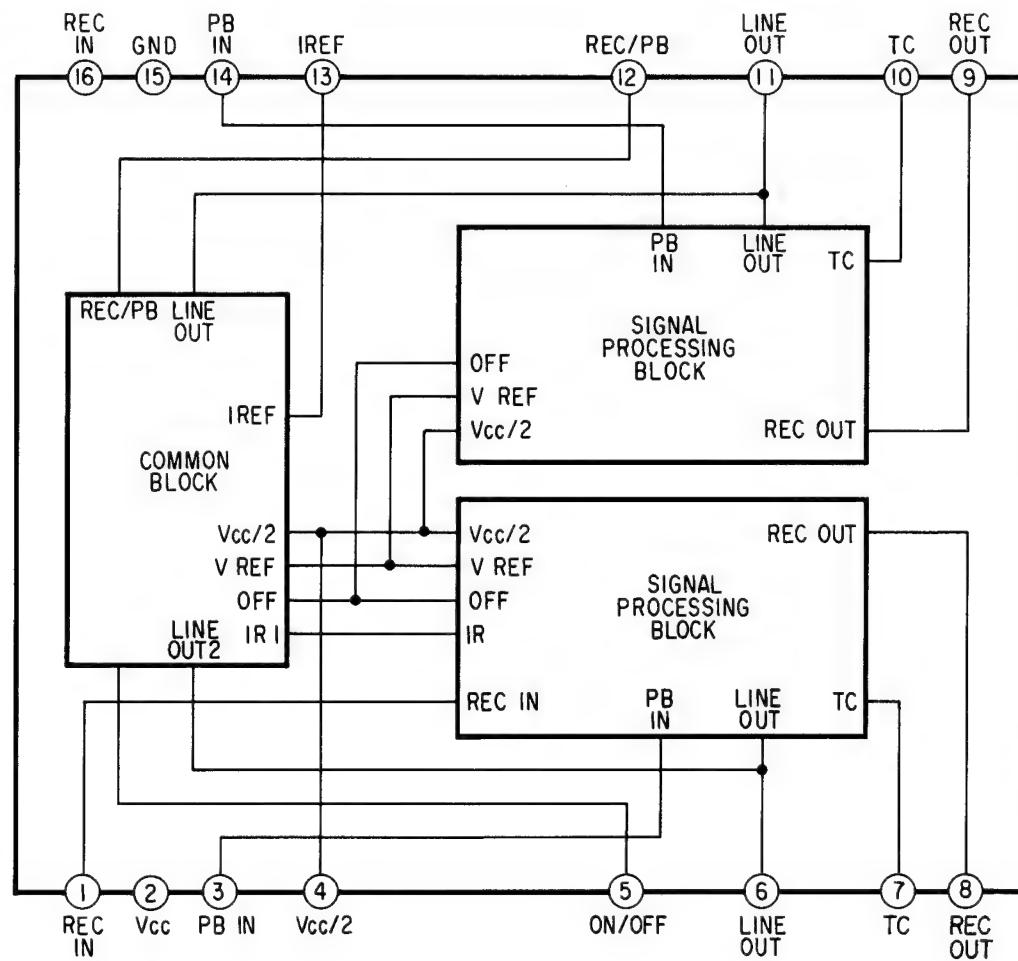
PIN Nr.	PIN NAMING	Z (in)	VDC	EQUIVALENT CIRCUIT	FUNCTION
6, 11	LINE OUT	-	6.0V		Line (decoding)-output terminals.
7, 10	TC	-	0.3V		Time-constant connection terminals for the level detectors.
8, 9	REC OUT	-	6.0V		Record (encoding)-output terminals.
12	REC/PB	-	-		Record/playback (encoding/decoding) changeover terminals. Playback (decoding): "H" (high) Record (encoding): "L" (low)

1-2. ON THE GATE ARRAY IC μ PD65005C112 (IC501)

This IC is used to accommodate the various functions of the double decks of this unit. This gate-array IC requires 4 (four) input and 5 (five) output signals.

PIN Nr.	PIN NAMING	Z (in)	VDC	EQUIVALENT CIRCUIT	FUNCTION
13	IREF	-	1.2V		Reference-current input terminal for the active filters.
15	GND	-	0V		<p>Acts as the grounding terminal in case of single-voltage power supply.</p> <p>Acts as the negative power-supply terminal in case of positive and negative two power-supply voltages are used.</p>

2) Block Diagram:



1) Descriptions of Pins and Functions

MEMO

PIN Nr.	PIN NAMING	INPUT OR OUTPUT	FUNCTION
8	RST	INPUT	Receives "L" (low)-state signal to reset all the output terminals at the power-on-reset condition.
9	GND	N/A	Grounding terminal.
10	GND	OUTPUT	Ground-return terminal.
11	DRP	OUTPUT	Controls the changeover of the Dolby recording and Dolby playback on receipt of the recording-condition signal or dubbing-condition signal. HIGH active. In the recording condition other than the dubbing modes, this terminal becomes in the recording state. In other modes than the recordings, this terminal becomes in the playback state.
12	DOM	OUTPUT	LINE-OUT muting terminal. Mutes the output line from the Dolby IC. HIGH active. LINE-OUT muting is disabled on receipt of "L" (low)-state signal. Outputs signal depending upon the input-signal condition of the AFW, BFW, REC and the DUB signals. DOM stands for Dolby-Output Muting. The signal from this terminal make a combination with the signal from the AOM terminal, pin 13 below.
13	AOM	OUTPUT	Switches the LINE-OUT signals. In the dubbing mode, the output signals from the playback amplifier of the "deck A" are to be directly dubbed and the monitoring is to be made possible during the dubbing operations, this terminal is also capable of muting these output signals from the "deck A". Namely, this terminal becomes in "L" (low) state when the muting to the output signals from the playback amplifiers of the "deck A" is to be turned off. This terminal make a combination with the DOM terminal, pin 12 outlined above. "HIGH" active, and means A-Out Muting.
14	BST	OUTPUT	Acts as the synchro-dubbing starter for the relayed plays from the "deck A" to "deck B". When any of the dubbing mode is set up and the recording is started while the playback operation at the "deck A" is not in action yet, the output signal from this terminal initiates routine to stop the motor of the "deck B" first. Then, the motor of the "deck B" starts to turn at the same moment the motor at the "deck A" starts to turn. Thus, the initialization of the synchro-start in the dubbing mode is made possible. The output signal is obtained depending upon the order of ON-OFF of the AFW and BFW signals and upon the state of ON-OFF of the REC signal. "HIGH" active, and means B-motor Stop.
15	AST	OUTPUT	Outputs effective signals in accordance with the order of ON-OFF of the AFW and BFW signals and with the state of the REC signal. When the BFW signals is present with the forward button of the "deck B" depressed earlier than the "deck A", and the forward button of the "deck A" is depressed successively, the motor at the "deck A" stops turning. Thus, the relayed playback from the "deck B" to "deck A" is made available.
16	BPM	OUTPUT	When both the forward buttons are depressed, this terminal transmits the signal to turn the muting signal for the deck effected earlier for forwarding mode. When one of the two decks are made into the playback mode, the muting action is effective only to that deck. "HIGH" active. BPM means B-deck Playback Muting and, APM stands for deck-A Playback Muting.
17	APM	OUTPUT	
18	VDD	INPUT	Power-supply voltage input terminal.

SECTION 2 ADJUSTMENTS

2-1. MECHANICAL ADJUSTMENTS PRECAUTION

- Clean the following parts with a denatured-alcohol-moistened swab:

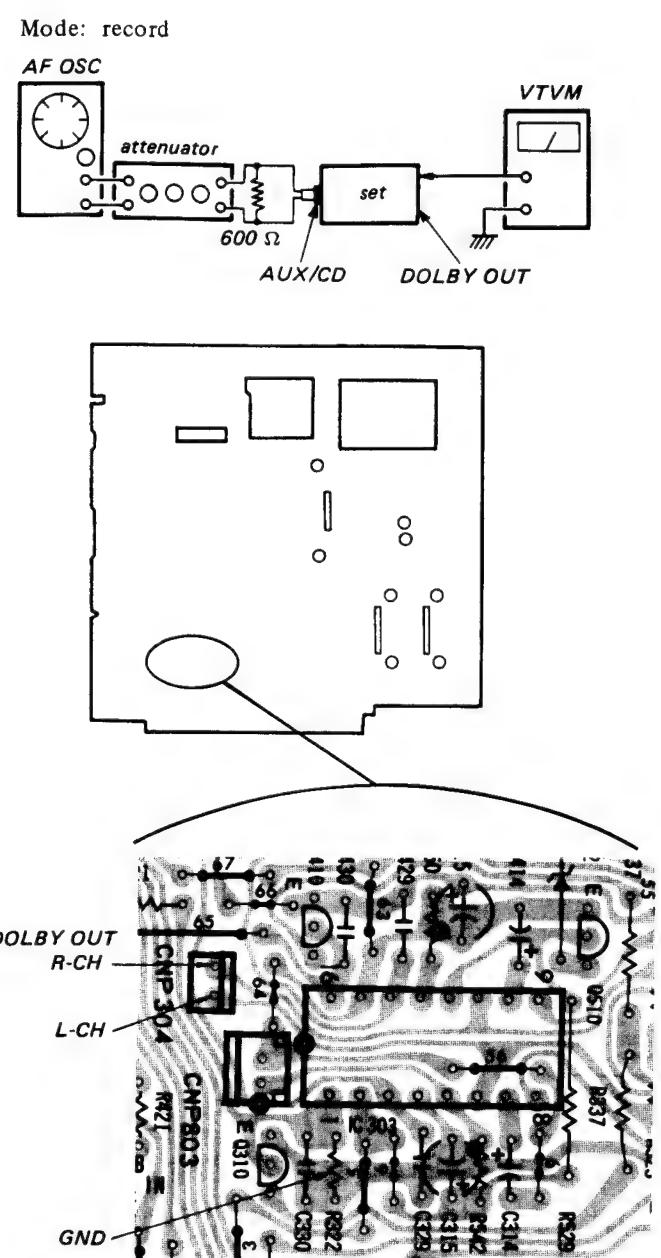
record/playback heads	pinch rollers
erase heads	rubber belts
capstan	idle
- Demagnetize the record/playback head with a head demagnetizer.
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage unless otherwise noted.

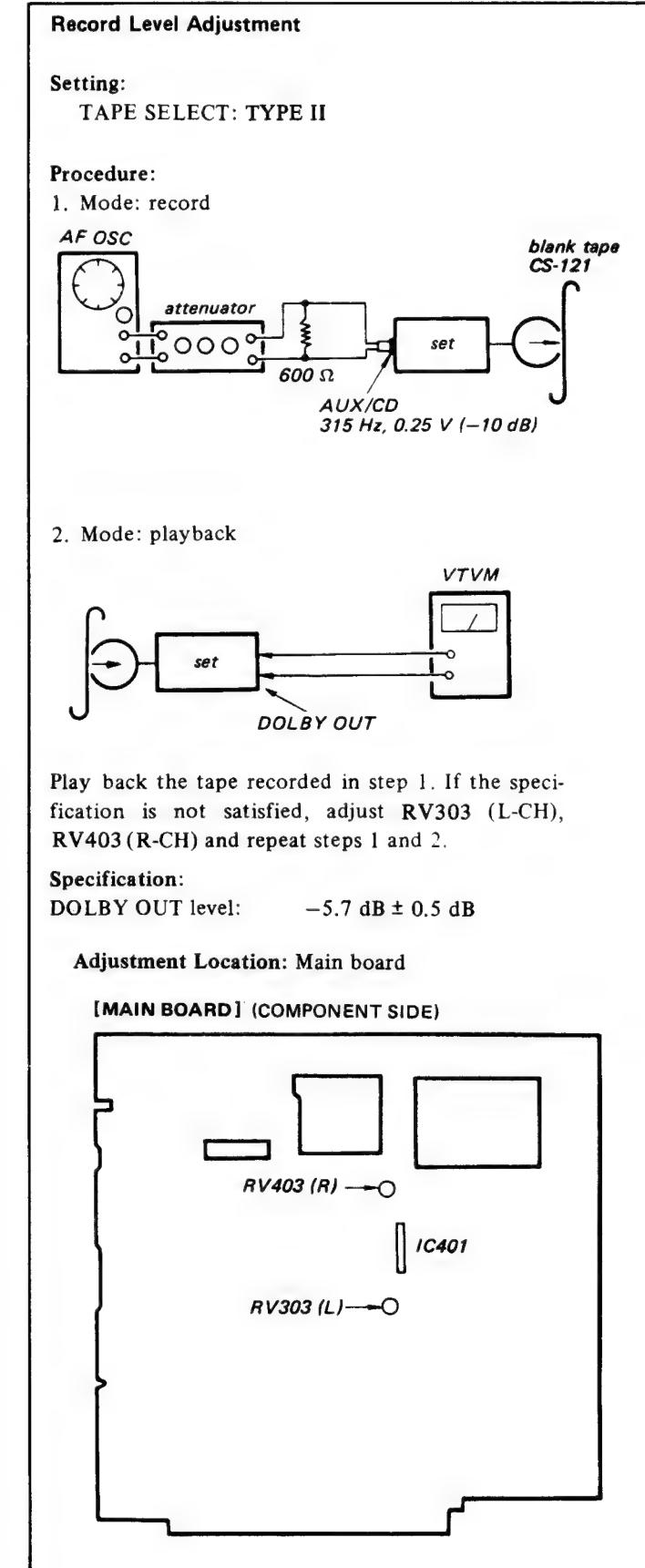
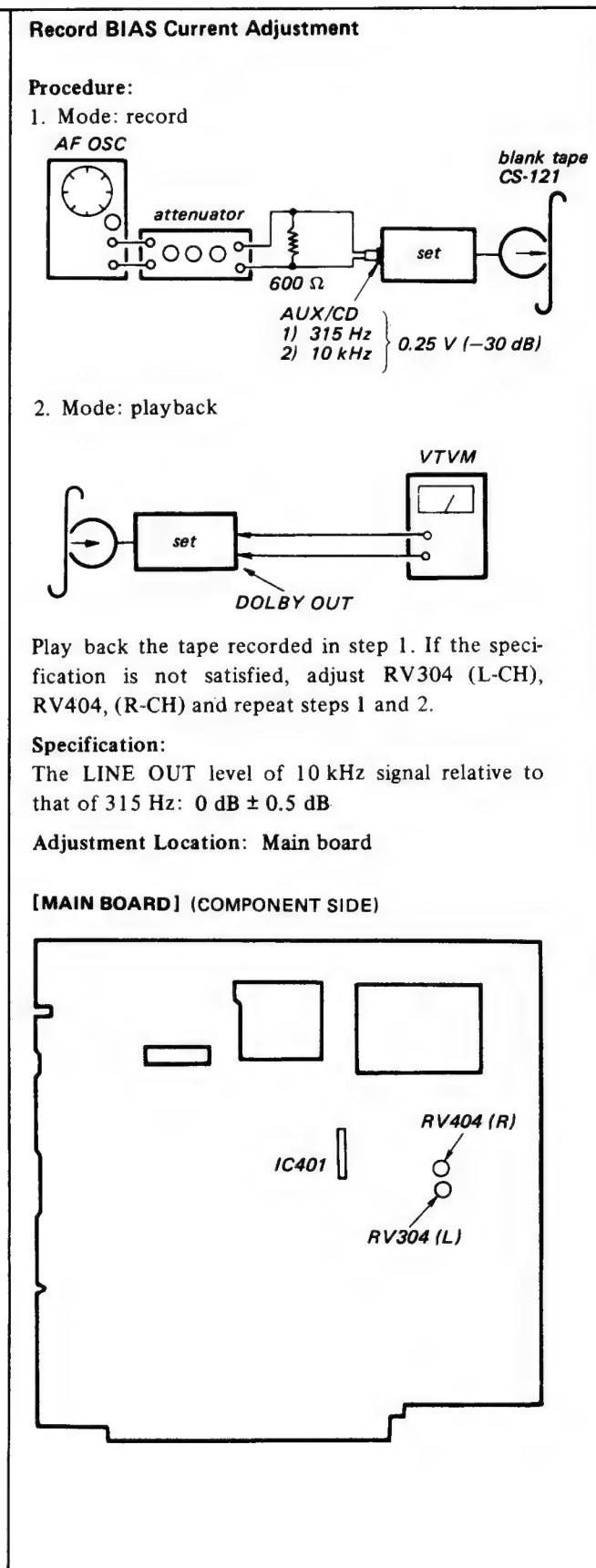
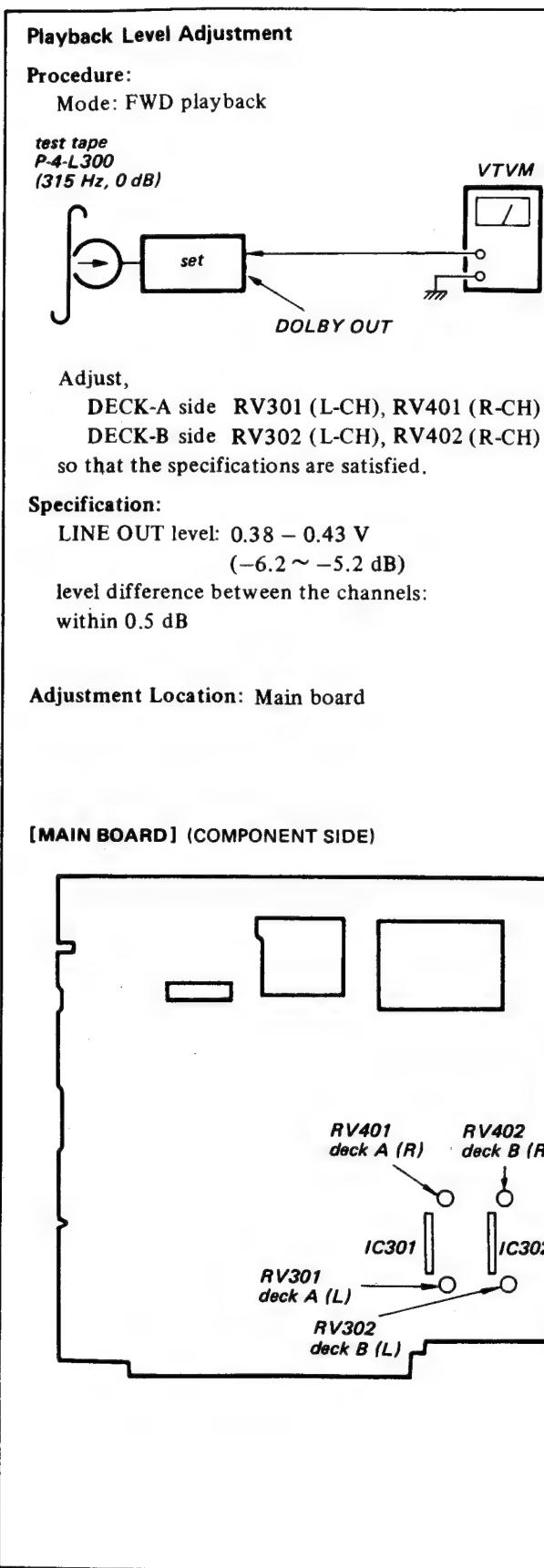
Torque Measurement

Torque	Torquement	Meter reading
FWD	CQ-102C	30 - 70 g·cm (0.42 - 0.97 oz·inch)
FWD Back tension	CQ-102C	1.5 - 5.5 g·cm (0.020 - 0.076 oz·inch)
FF. REW	CQ-201B	63 g·cm or more 0.87 oz·inch)

2-2. ELECTRICAL ADJUSTMENTS

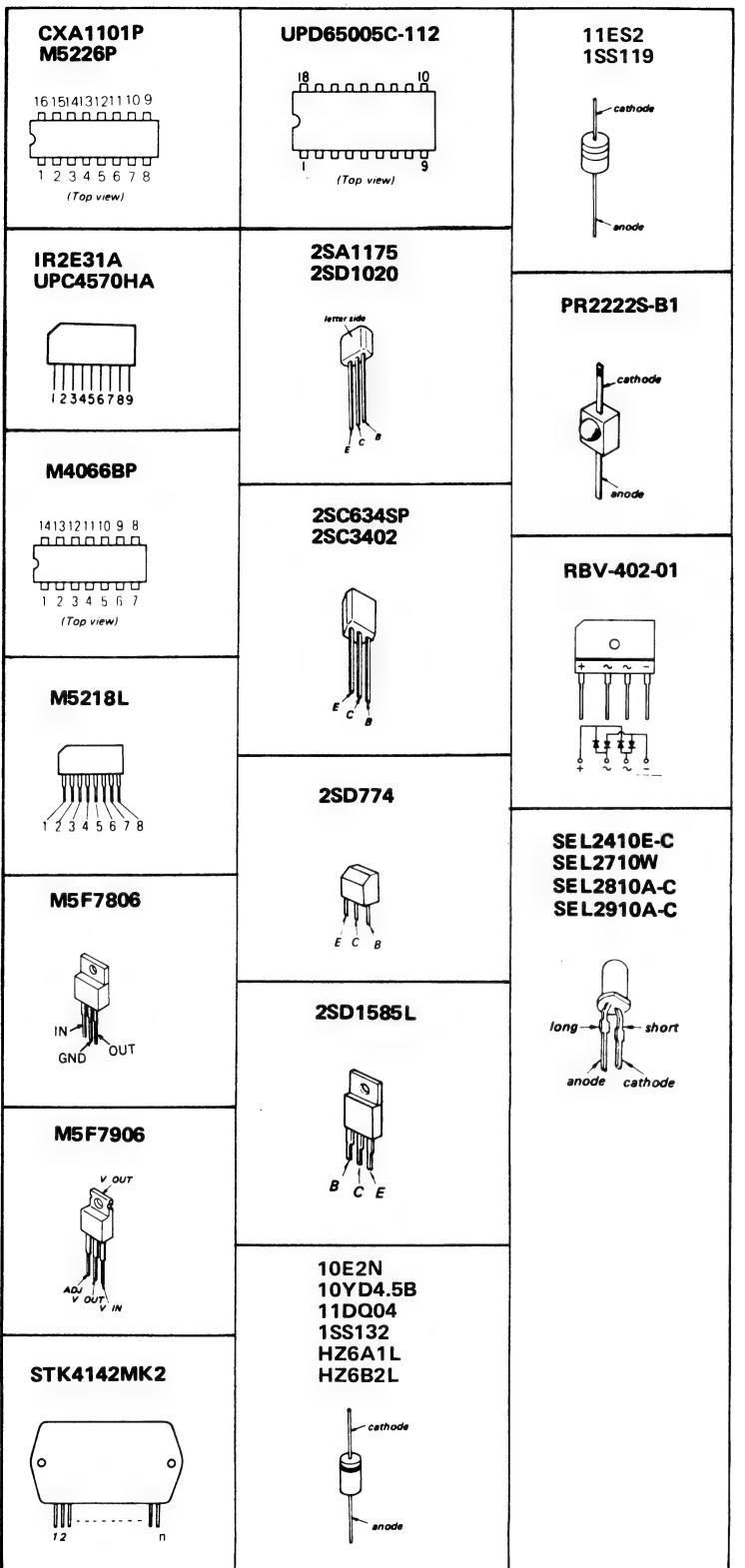
- Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage unless otherwise noted.
- The adjustments should be performed in the order given in this service manual. (As a general rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)
- The adjustments should be performed for both L-CH and R-CH.
- Switches and controls should be set as follows unless otherwise specified.
 - DOLBY NR switch: OFF
 - Standard Record: Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.





SECTION 3 DIAGRAMS

Semiconductor Lead Layouts

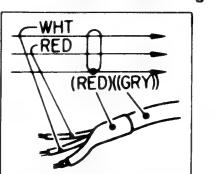


• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
IC101	H-3	Q554	F-21	D901	B-7
IC102	I-5	Q701	B-12	D902	B-7
IC103	C-19	Q702	B-12	D904	G-17
IC151	I-2	Q703	C-11	D905	G-17
IC161	J-3	Q751	D-12	D906	G-17
IC162	J-3	Q801	B-13	D907	G-17
IC163	J-4	Q802	C-13	D908	D-17
IC164	J-5	Q901	G-15	D909	C-17
IC165	J-6			D910	C-17
IC202	I-8			D911	B-17
IC301	H-23	D101	H-2	D912	J-17
IC302	H-24	D102	H-3	D914	F-17
IC303	H-20	D103	H-4	D951	J-19
IC304	I-22	D104	H-5	D952	B-18
IC401	F-22	D105	H-6	D953	D-18
IC501	F-20	D111	J-2	D954	D-18
IC701	B-11	D112	J-2	D955	J-18
IC751	B-12	D113	K-2		
IC901	G-14	D114	K-2		
IC902	G-15	D115	K-2		
Q301	J-23	D121	J-3		
Q302	J-24	D122	J-3		
Q303	J-24	D123	K-3		
Q304	J-25	D124	K-3		
Q305	F-22	D125	K-3		
Q306	F-23	D131	J-4		
Q307	G-23	D132	J-4		
Q308	F-23	D133	K-4		
Q310	I-19	D134	K-4		
Q311	F-22	D135	K-4		
Q401	H-23	D141	J-4		
Q402	G-24	D142	J-4		
Q403	G-23	D143	K-4		
Q404	G-25	D144	K-4		
Q405	E-22	D145	K-4		
Q406	E-23	D151	J-5		
Q407	D-23	D152	J-5		
Q408	E-23	D153	K-5		
Q410	H-19	D154	K-5		
Q411	E-22	D155	K-5		
Q501	E-25	D501	F-24		
Q502	E-24	D502	H-20		
Q503	E-25	D503	Q-21		
Q504	E-24	D504	H-21		
Q505	D-24	D505	B-15		
Q506	G-20	D506	B-15		
Q507	E-12	D507	B-14		
Q508	E-13	D508	G-19		
Q509	G-22	D509	H-19		
Q510	H-21	D510	G-20		
Q511	G-12	D511	G-20		
Q513	E-12	D512	G-20		
Q514	E-13	D513	E-24		
Q515	G-13	D551	E-21		
Q516	G-12	D552	E-21		
Q517	H-22	D701	B-10		
Q518	H-22	D702	D-11		
Q551	F-21	D703	D-11		
Q552	F-21	D751	C-9		
Q553	D-21	D801	C-11		

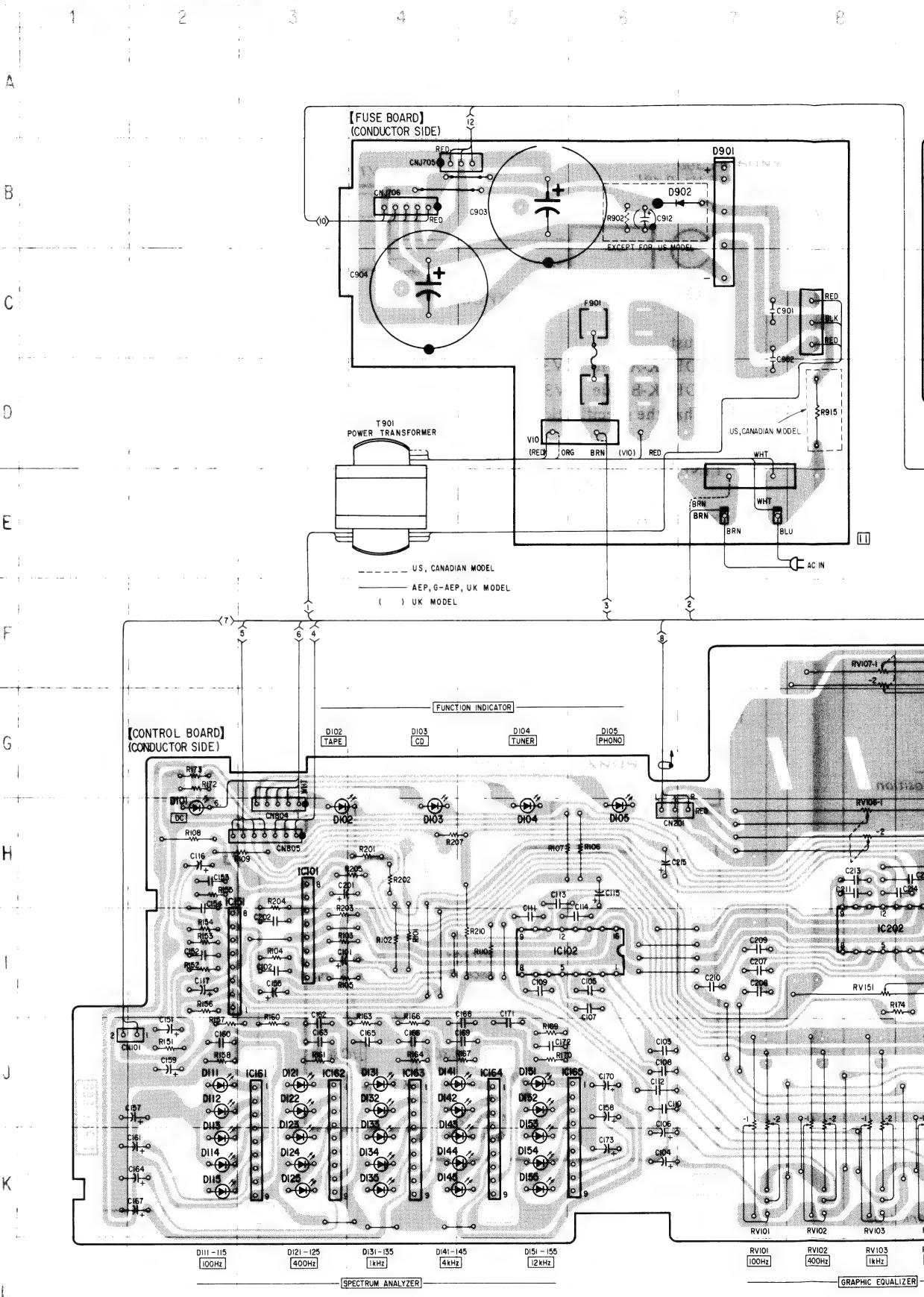
Note:

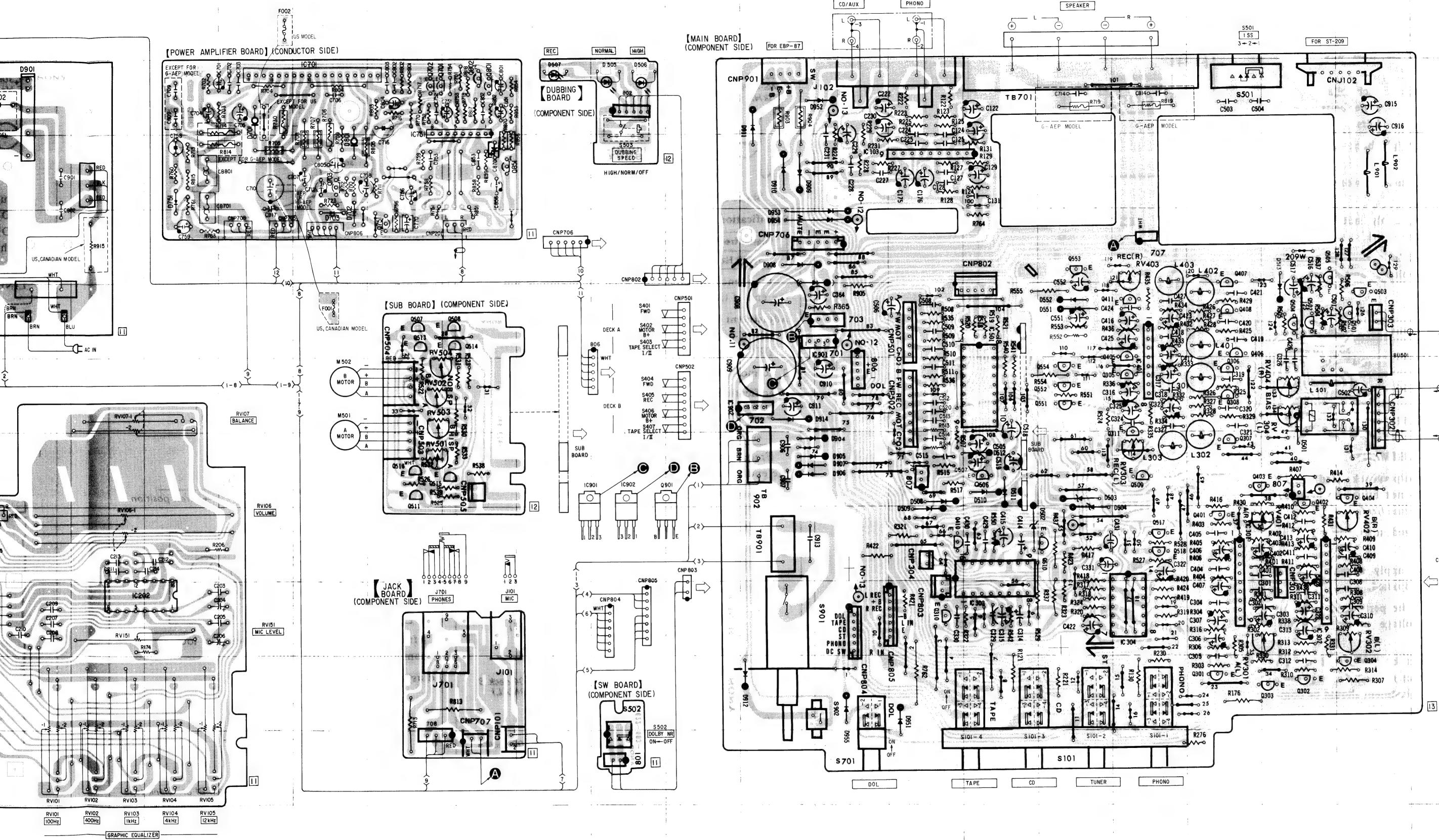
- Color code of sleeving over the end of the jacket.



- — : parts extracted from the component side.

3-1. MOUNTING DIAGRAM





SECTION 2 ADJUSTMENTS

2-1. MECHANICAL ADJUSTMENTS PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

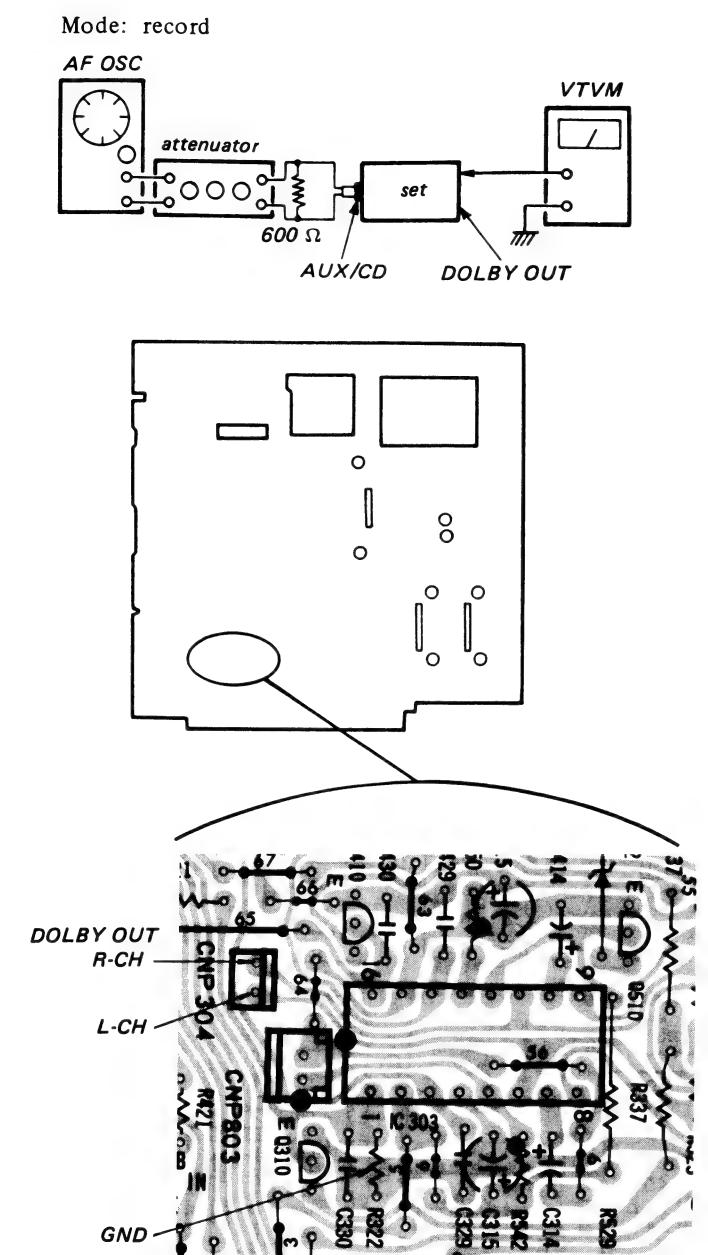
record/playback heads	pinch rollers
erase heads	rubber belts
capstan	idle
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Torquement	Meter reading
FWD	CQ-102C	30 - 70 g·cm (0.42 - 0.97 oz·inch)
FWD Back tension	CQ-102C	1.5 - 5.5 g·cm (0.020 - 0.076 oz·inch)
FF. REW	CQ-201B	63 g·cm or more 0.87 oz·inch)

2-2. ELECTRICAL ADJUSTMENTS

1. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
2. Do not use a magnetized screwdriver for the adjustments.
3. After the adjustments, apply suitable locking compound to the parts adjusted.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
5. The adjustments should be performed in the order given in this service manual. (As a general rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)
6. The adjustments should be performed for both L-CH and R-CH.
- Switches and controls should be set as follows unless otherwise specified.
 - DOLBY NR switch: OFF
 - Standard Record: Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.



Standard Input Level

	AUX/CD
source impedance	600 Ω
input level	0.35 V (-7 dB)

Standard Output Level

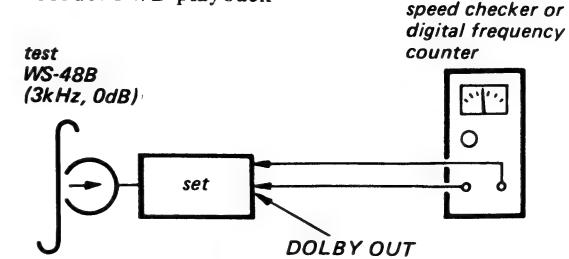
	DOLBY OUT
load impedance	nothing
output level	0.4 V (-5.7 dB)

Tape Speed Adjustment

Procedure:

Mode: FWD playback

test
WS-48B
(3kHz, 0dB)



1. Short CNP505 with a lead wire.

Specification: high speed

Digital frequency counter
5,950 Hz - 6,010 Hz

Frequency difference between the beginning and the end of the tape should be within 0.25% (15 Hz).

Adjustment location:

DECK-A side RV501
DECK-B side RV503

2. Remove the wire in step 1.

Specification: normal speed

Digital frequency counter
2,970 Hz - 2,990 Hz

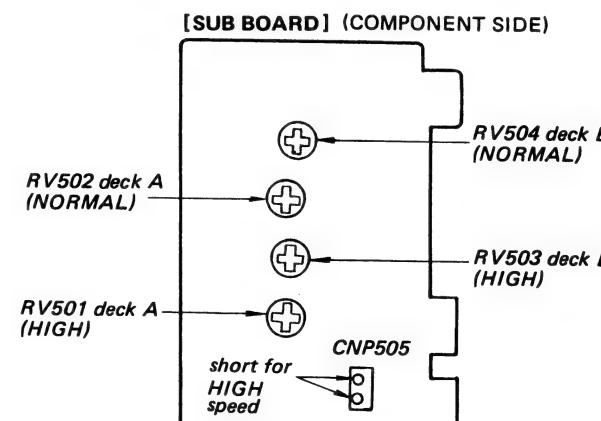
Frequency difference between the beginning and the end of the tape should be within 0.25% (15 Hz).

Adjustment location:

DECK-A side RV502
DECK-B side RV504

3. If the specifications are not satisfied, repeat steps 1 and 2.

Adjustment Location: SUB board



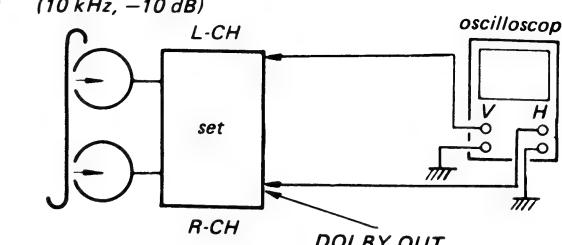
Record/Playback Head Azimuth Adjustment

Note: Perform this adjustment for both decks.

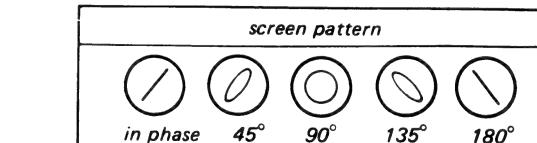
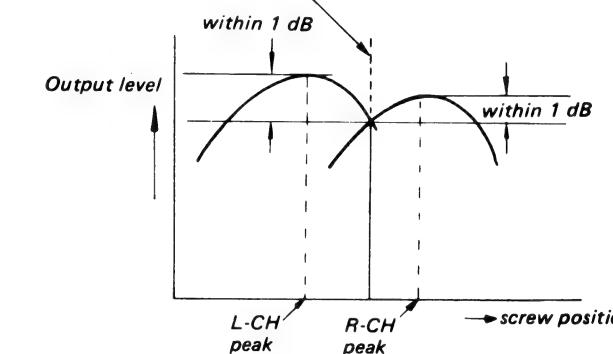
Procedure:

1. Mode: FWD playback

test tape
P-4-A100
(10 kHz, -10 dB)

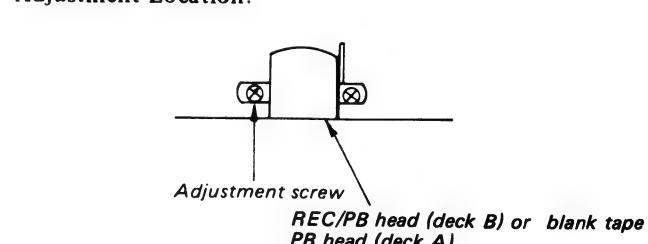


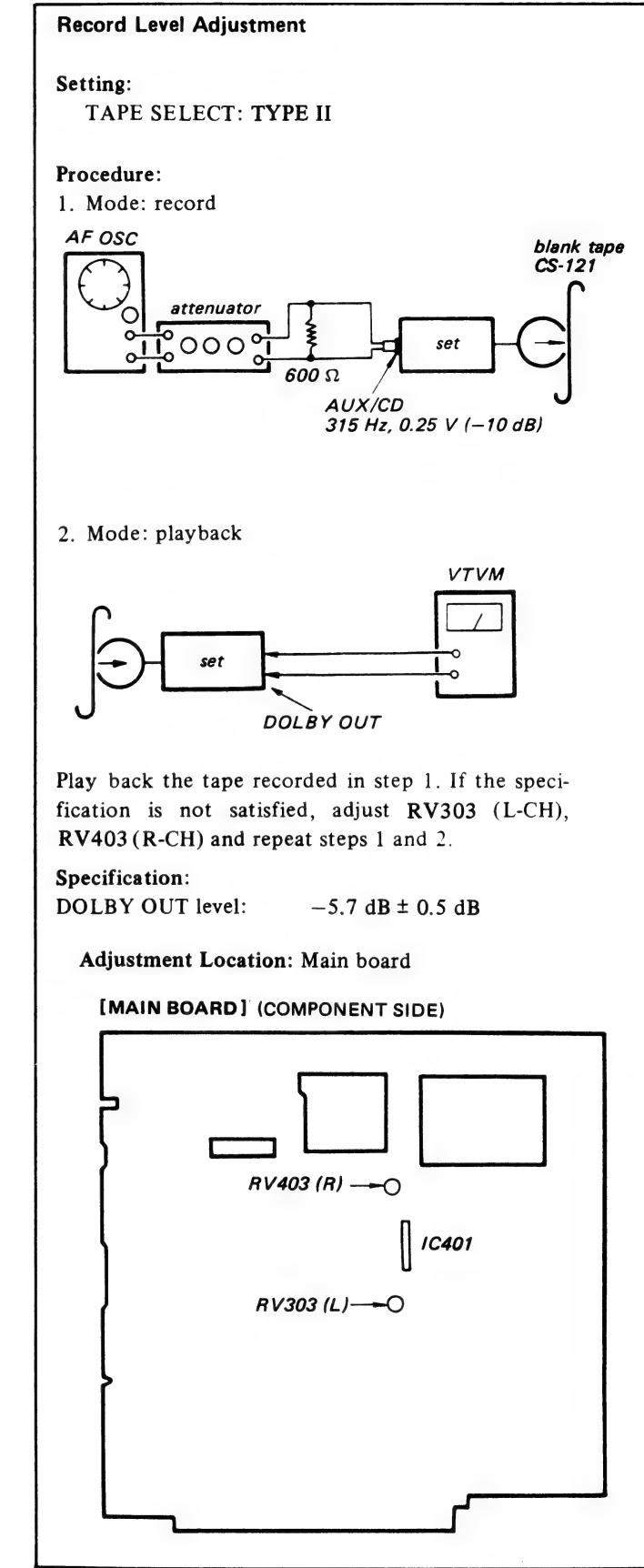
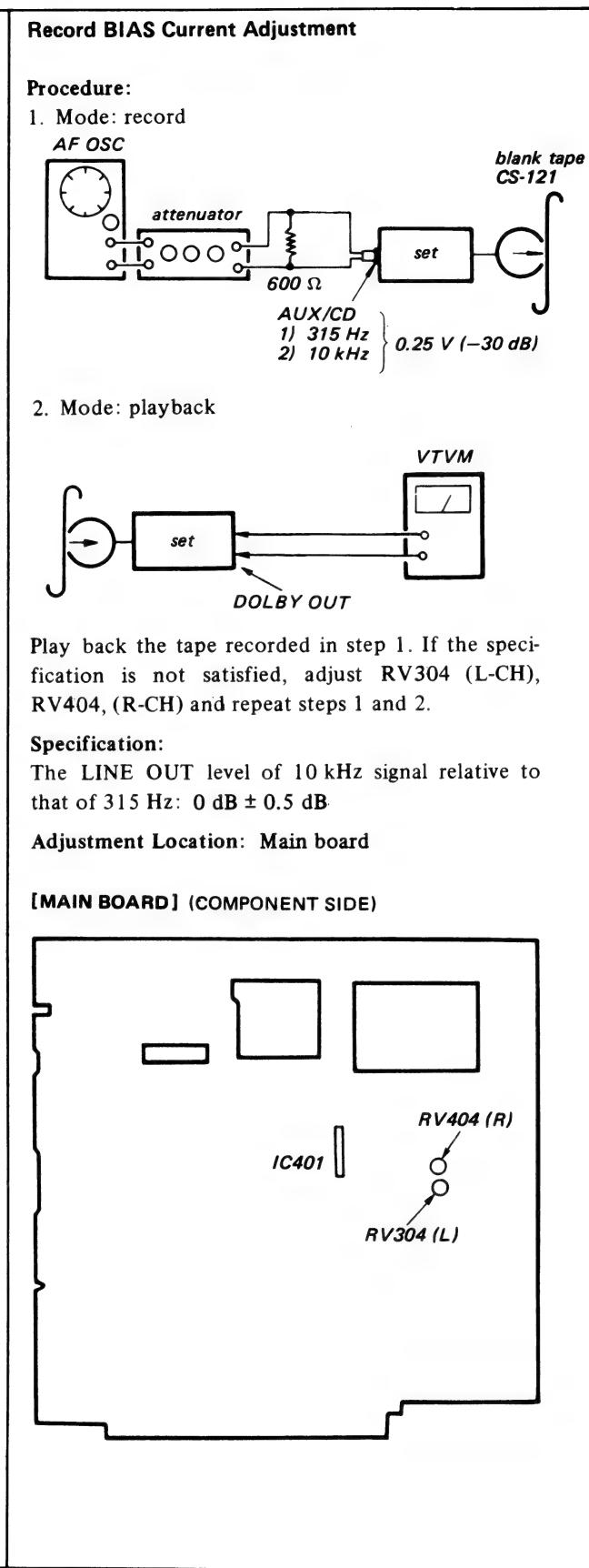
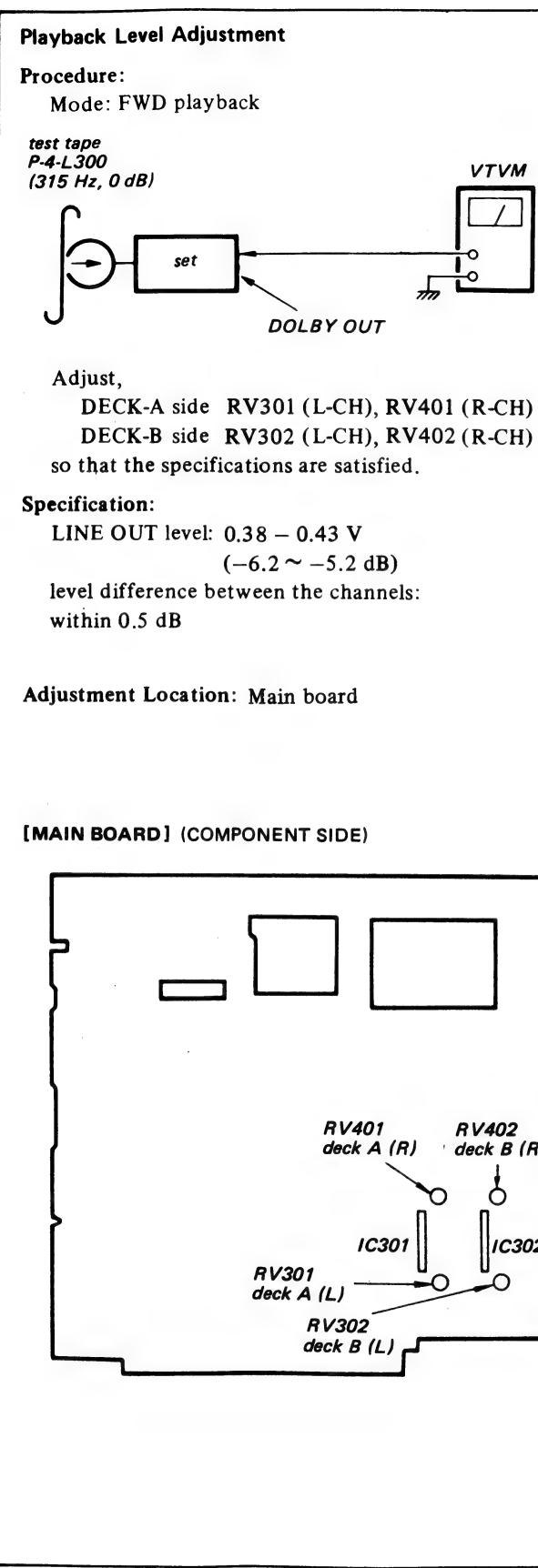
2. Turn the adjustment screw and check output peaks. If the peaks do not match for L-CH and R-CH, turn the adjustment screw so that outputs match within 1 dB of peak.



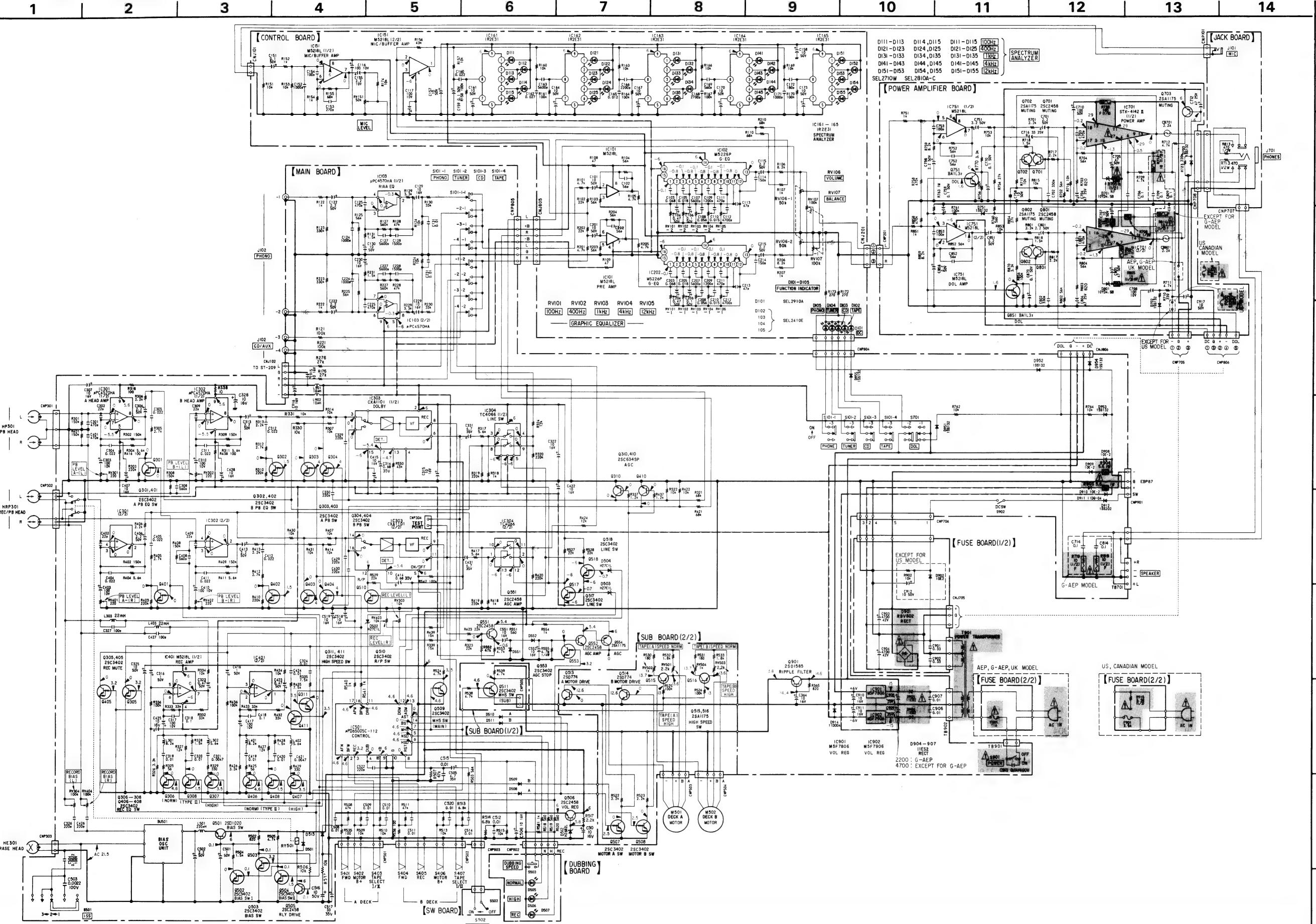
3. After the adjustments, apply suitable locking compound to the parts adjusted.

Adjustment Location:





3-2. SCHEMATIC DIAGRAM



- Note:**
- All capacitors are in 50 WV or less are and tantalums.
 - All resistors are in specified.

□ PHONO (L)
 □ PHONO (R)
 □ CD/AUX (L)
 □ CD/AUX (R)

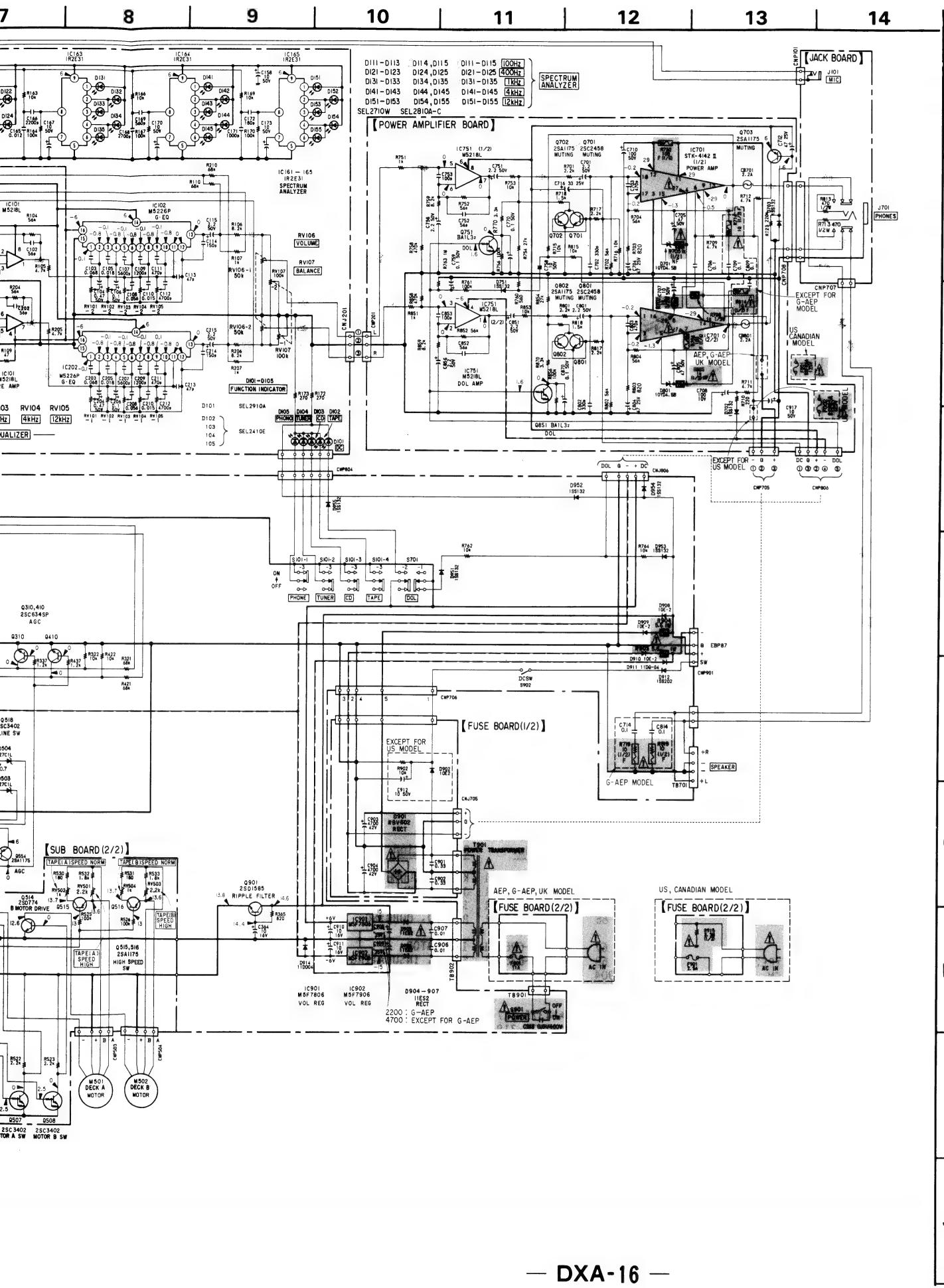
Note: The components in the shaded areas are critical part numbers.

- Components for right channel. Reference
- □ : nonflammable
- □ : fusible resistor
- Switch

Ref. No.	Switch
S1	A-F
S2	A-MOT
S3	A-TAPE S
S4	B-FV
S5	REC
S6	B-MOT
S7	B-TAPE S
S101	FUNCT
S501	ISS
S502	DOLBY
S503	DUBBING
S701	DOL
S901	AC POW
S902	DC POW

- — : B+ bus.
- - - - : B- bus.
- □ : adjustment
- AC voltage readings
- Readings are taken with a VOM (50 kΩ)

STOP mode only



7 8 9 10 11 12 13 14 A B C D E F G H I J

Note:

- All capacitors are in μ F unless otherwise noted. pF: $\mu\mu$ F 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4$ W or less unless otherwise specified.

■ PHONO (L) ■ TAPE (L) ■ TUNER (L)
 ■ PHONO (R) ■ TAPE (R) ■ TUNER (R)
 ■ CD/AUX (L) ■ CD/AUX (R)

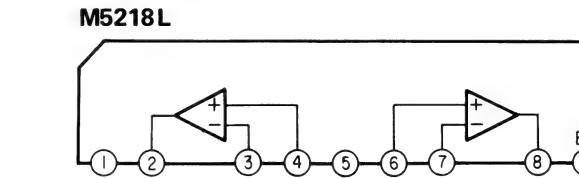
Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

- Components for right channel have same values as for left channel. Reference numbers are coded from
- : nonflammable resistor.
- : fusible resistor.
- Switch

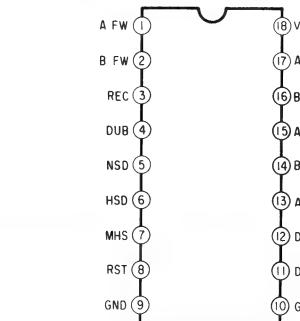
Ref. No.	Switch	Position
S1	A-FW	OFF
S2	A-MOTOR	OFF
S3	A-TAPE SELECT	TYPE-I
S4	B-FW	OFF
S5	REC	OFF
S6	B-MOTOR	OFF
S7	B-TAPE SELECT	TYPE-I
S101	FUNCTION	PHONO
S501	ISS	1
S502	DOLBY NR	OFF
S503	DUBBING SPEED	NORM
S701	DOL	OFF
S901	AC POWER	OFF
S902	DC POWER	OFF

- : B+ bus.
- - - : B- bus.
- : adjustment for repair.
- AC voltage readings in the bias oscillator with a VTVM.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 k Ω /V).

STOP mode only

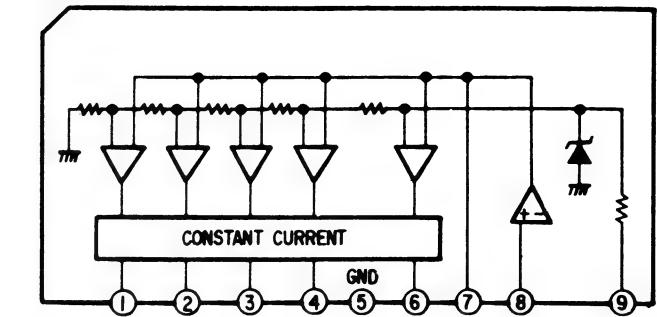


μ PD65005C112

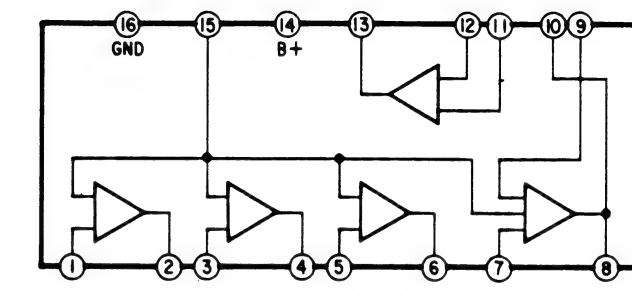


● IC BLOCK DIAGRAM

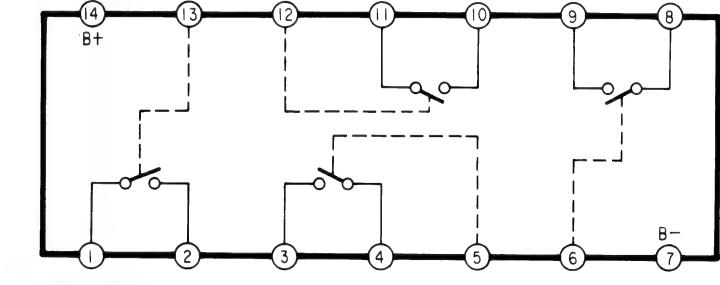
IR2E31A



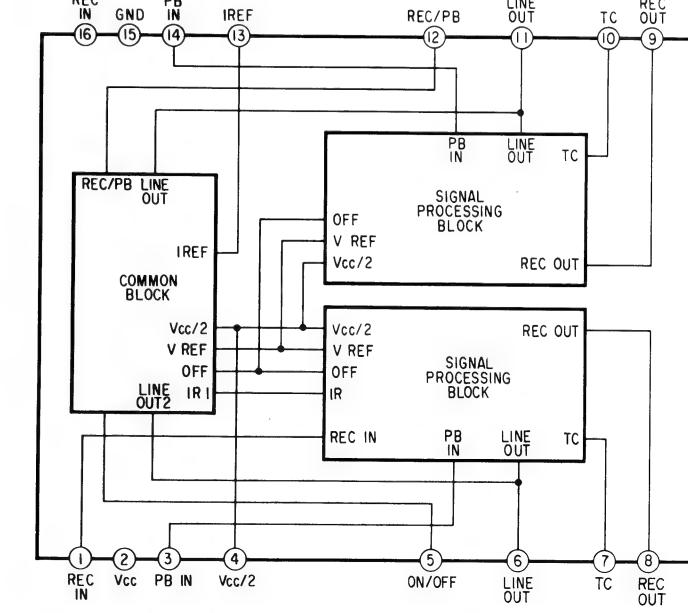
M5226P



μ 4066BP



CXA1101P



SECTION 4 EXPLODED VIEWS

NOTE:
• The mechanical parts with no reference number in the exploded views are not supplied.

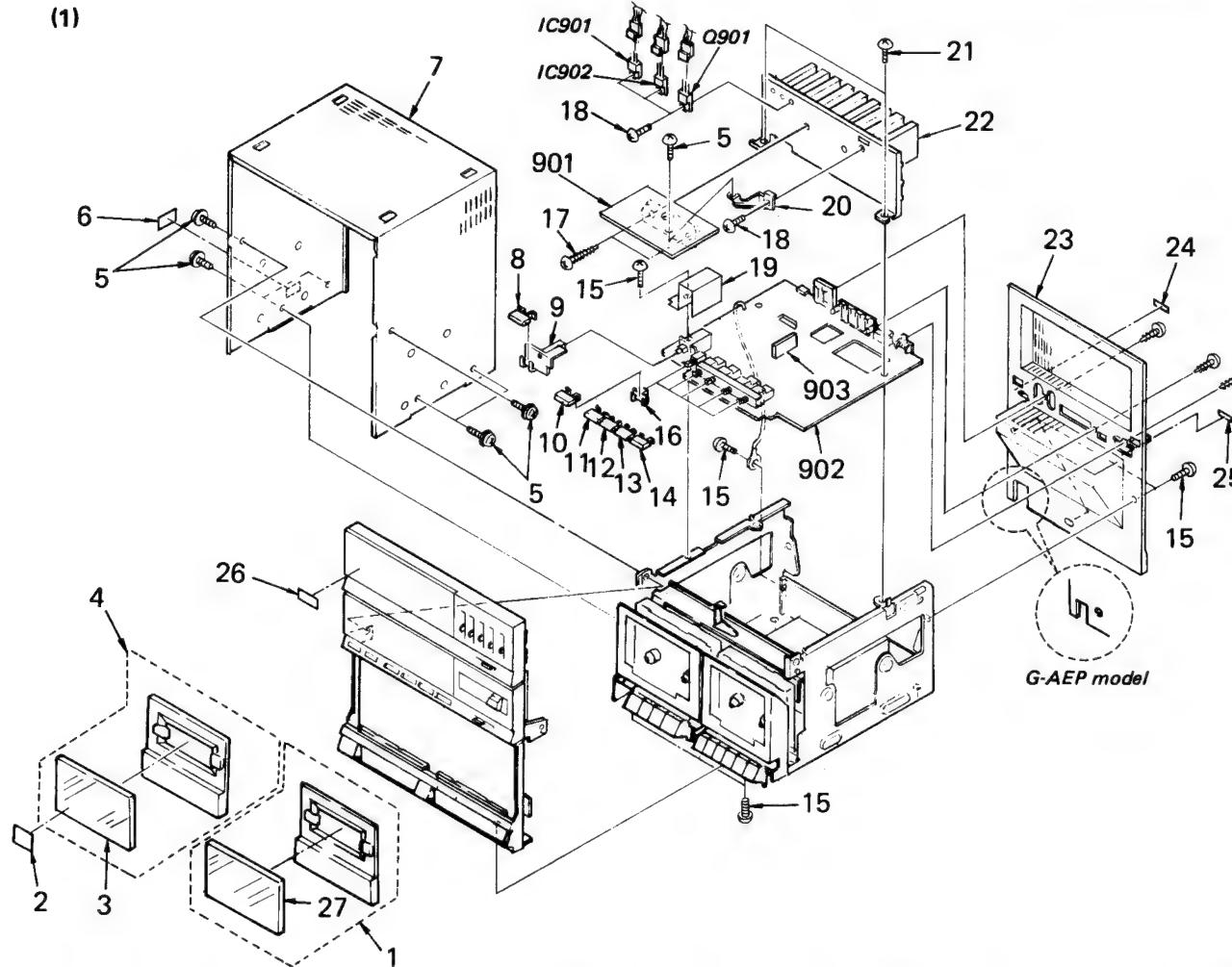
• Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• The construction parts of an assembled part are indicated with a collation number in the remark column.

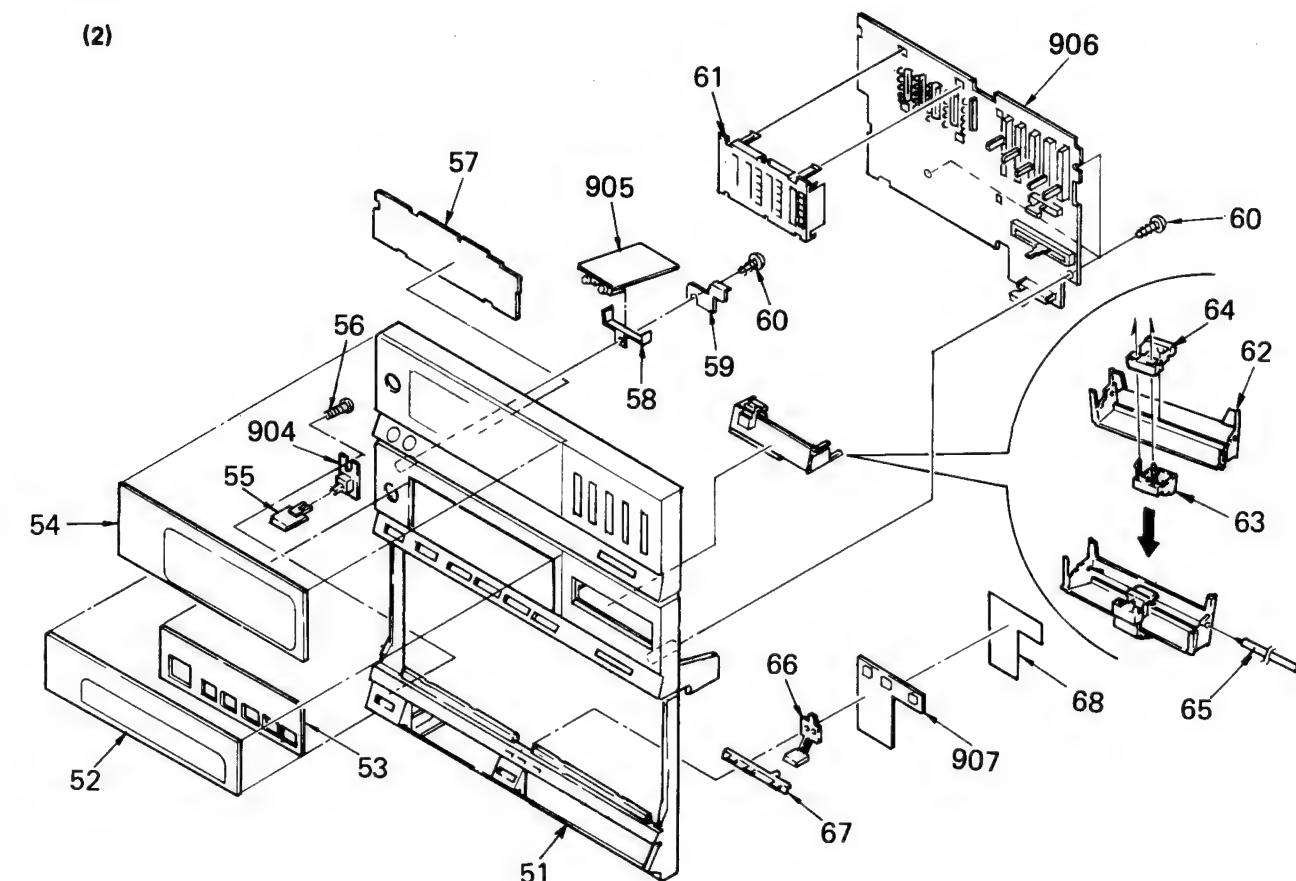
• Color Indication of Appearance Parts
Example: (RED) KNOB, BALANCE
(WHITE) Cabinet's Color Parts' Color

The components identified by shading and mark  are critical for safety.
Replace only with part number specified.

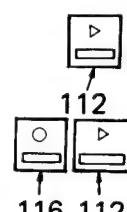
(1)



(2)



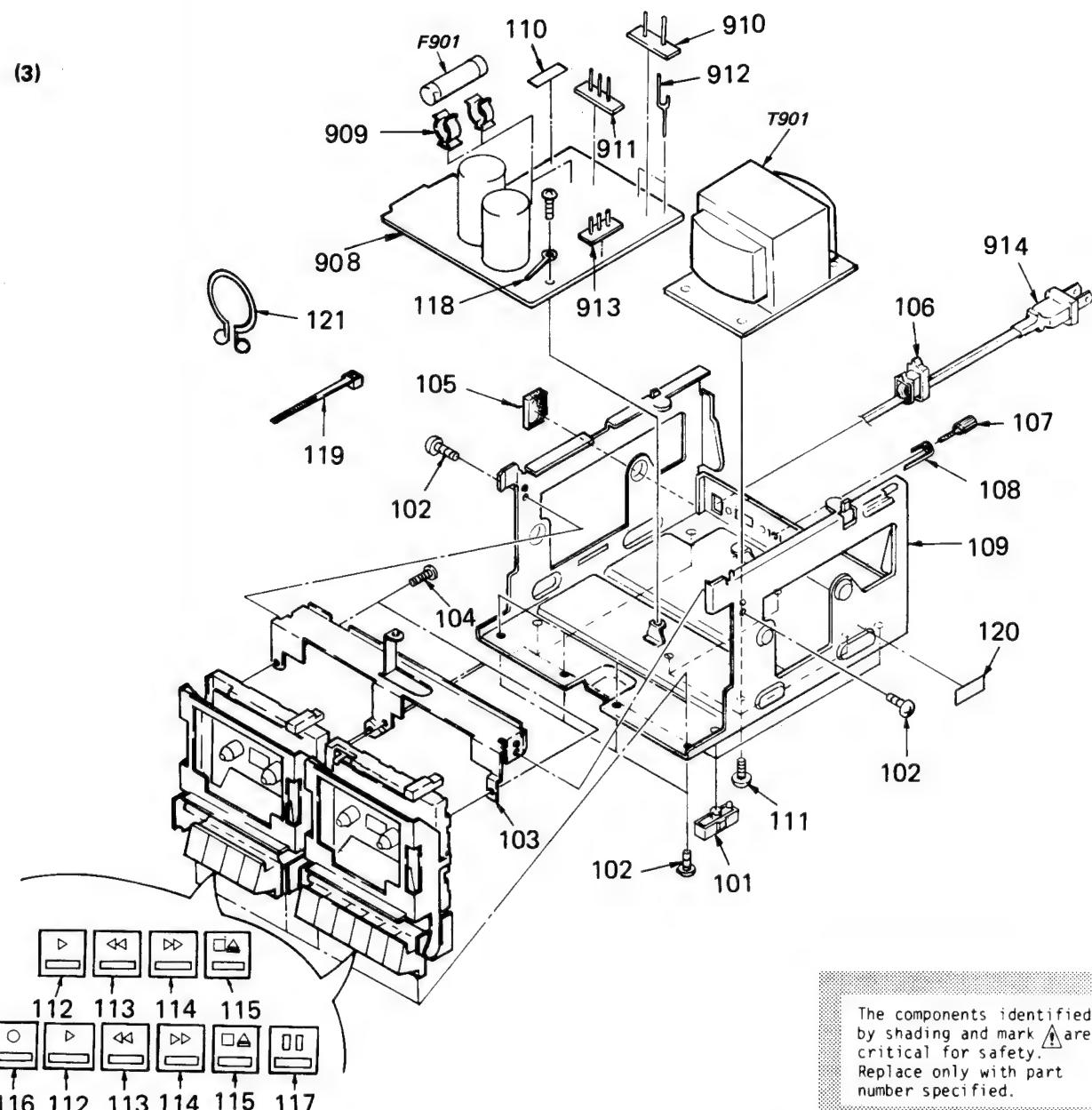
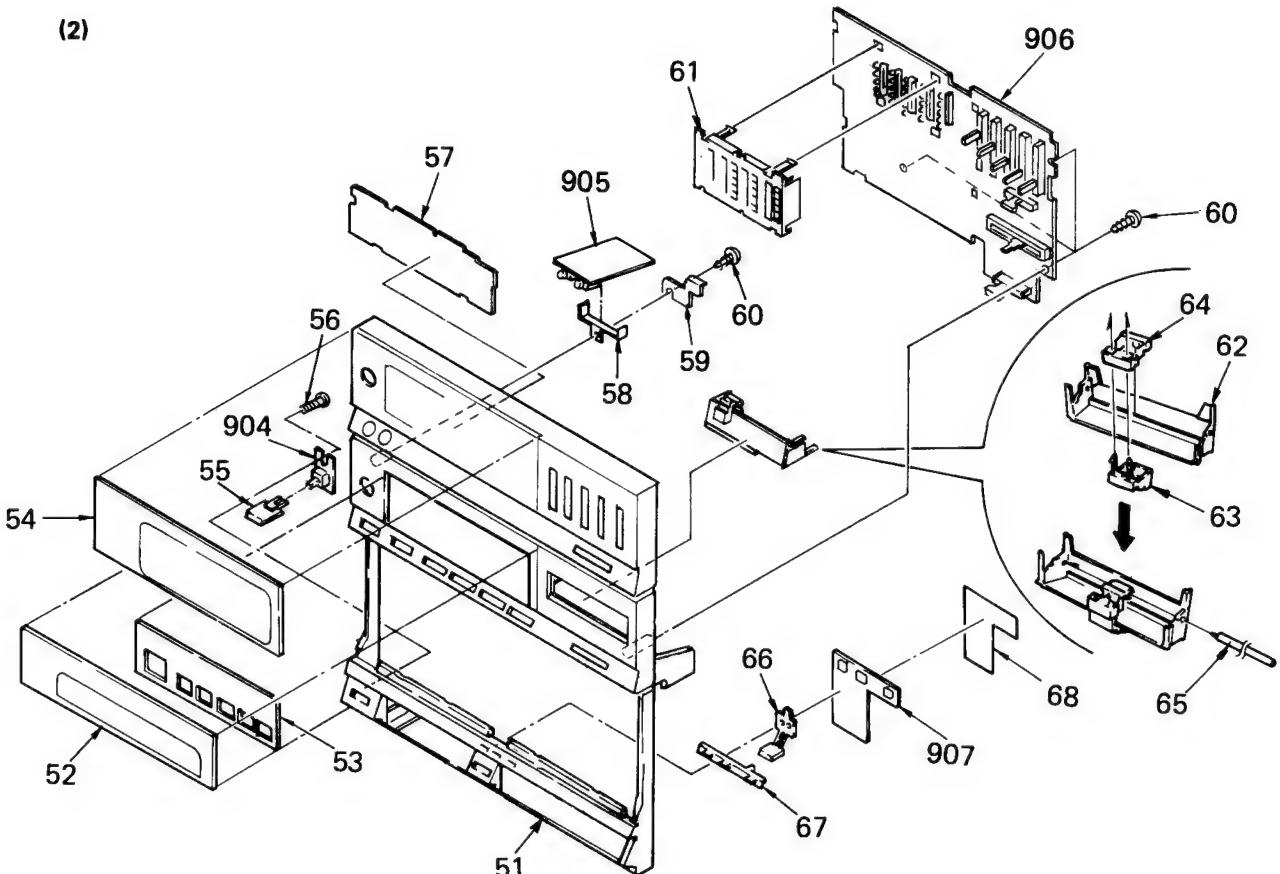
(3)



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	X-4919-619-1	LID (B) ASSY, CASSETTE		15	7-682-147-01	SCREW +BVTT 3X6 (S)	
2	3-703-713-41	STICKER, SONY SYMBOL (10)		16	*4-919-654-01	JOINT, FUNCTION	
3	4-920-812-01	WINDOW (A), CASSETTE		17	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	
4	X-4919-618-1	LID (A) ASSY, CASSETTE		18	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
5	7-682-148-09	SCREW, M3 CASE STOPPER		19	*4-920-828-01	COVER, AC	
6	*4-919-669-01	(Canadian)...LABEL, MODEL NUMBER (CA)		20	*4-910-064-01	BRACKET (H), PC BOARD	
	*4-920-801-01	(UK).....LABEL, MODEL NUMBER (UK)		21	7-682-148-01	SCREW +BVTT 3X8 (S)	
	*4-920-802-01	(AEP).....LABEL, MODEL NUMBER (AE2)		22	*4-919-663-11	HEAT SINK	
	*4-920-803-01	(AEP).....LABEL, MODEL NUMBER (AE1)		23	*4-919-664-11	(EXCEPT FOR G-AEP)...PLATE, JACK	
	*4-920-804-01	(G-AEP).....LABEL, MODEL NUMBER (AE4)			*4-919-664-21	(G-AEP).....PLATE, JACK	
	*4-920-849-01	(US).....LABEL, MODEL NUMBER (U)		24	*4-919-645-01	LABEL (B), CONNECTOR	
7	4-920-815-01	CASE		25	*4-919-644-01	LABEL (A), CONNECTOR	
8	4-914-396-11	BUTTON (DOL)		26	3-701-690-00	(UK)....LABEL (MADE IN JAPAN)	
9	*4-919-659-01	JOINT, POWER		27	4-920-813-01	WINDOW (B), CASSETTE	
10	4-914-396-01	BUTTON (POWER)		901	*1-622-523-11	PC BOARD, POWER AMPLIFIER	
11	4-914-396-21	BUTTON (TAPE)		902	*A-4410-505-A	(Canadian,AEP,UK)...MOUNTED PCB, MAIN	
12	4-914-396-31	BUTTON (CD)			*A-4410-515-A	(G-AEP).....MOUNTED PCB, MAIN	
13	4-914-396-41	BUTTON (TUNER)			*A-4410-544-A	(US).....MOUNTED PCB, MAIN	
14	4-914-396-51	BUTTON (PHONO)		903	1-622-665-11	PC BOARD, SUB	

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	X-4919-620-1	PANEL ASSY		63	4-919-639-01	KNOB, VOLUME	
52	4-919-660-11	PLATE (B), ORNAMENTAL		64	*4-919-658-01	JOINT, VOL	
53	4-914-397-21	PLATE (FUNCTION), INDICATION		65	*4-919-655-01	SHAFT, SLIDE	
54	4-919-661-11	PLATE (A), ORNAMENTAL		66	4-920-811-01	BUTTON, DUBBING	
55	4-920-810-01	BUTTON, DOLBY		67	4-919-698-01	INDICATOR	
56	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S		68	4-920-836-01	SCHEET, INSULATING	
57	*4-919-653-01	SCHEET (A), INDICATION		904	1-622-663-11	PC BOARD, SWITCH	
58	*4-919-656-01	BRACKET, HP		905	1-622-664-11	PC BOARD, JACK	
59	*4-920-831-01	REINFORCEMENT		906	*A-4375-317-A	(G-AEP).....MOUNTED PCB, CONTROL	
60	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			*A-4375-318-A	(Canadian,AEP,UK)...MOUNTED PCB, CONTROL	
61	*4-919-657-01	HOUSE, SPECTRUM ANALYZER			*A-4375-328-A	(US).....MOUNTED PCB, CONTROL	
62	4-919-662-01	HOUSE, VOLUME		907	1-622-662-11	PC BOARD, DUBBING	

No.	Part No.
101	X-4902-1
102	7-682-1
103	*4-920-8
104	7-685-1
105	9-911-0
106	*3-703-2
107	3-706-1
108	3-701-9
109	*X-4919-
110	*3-701-9
	*3-701-9
111	7-682-1
112	4-920-8
113	4-920-8
114	4-920-8
115	4-920-8
116	4-920-8
117	4-920-8
118	*3-701-8
119	*3-683-6



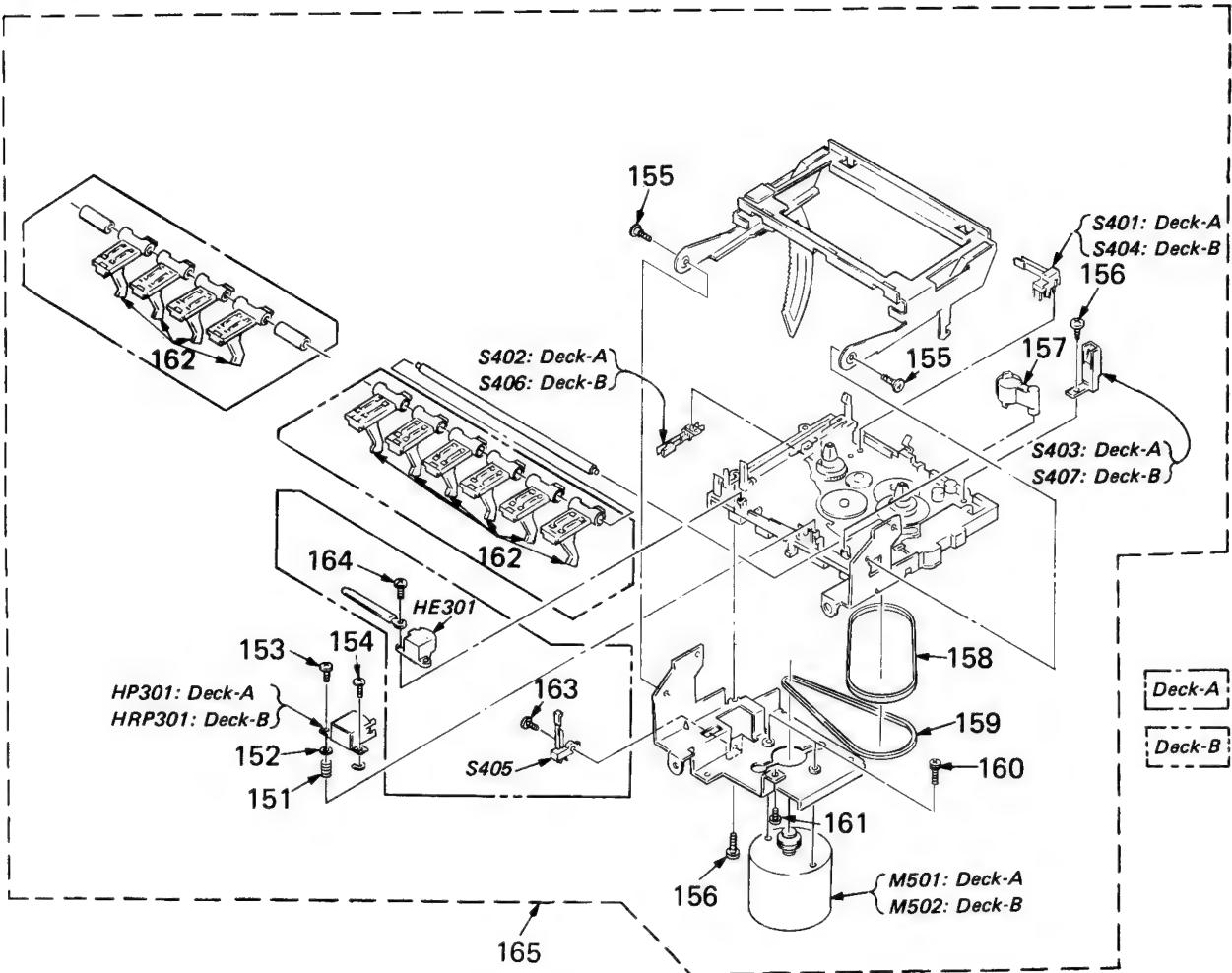
The components identified by shading and mark  are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	X-4919-620-1	PANEL ASSY		63	4-919-639-01	KNOB, VOLUME	
52	4-919-660-11	PLATE (B), ORNAMENTAL		64	*4-919-658-01	JOINT, VOL	
53	4-914-397-21	PLATE (FUNCTION), INDICATION		65	*4-919-655-01	SHAFT, SLIDE	
54	4-919-661-11	PLATE (A), ORNAMENTAL		66	4-920-811-01	BUTTON, DUBBING	
55	4-920-810-01	BUTTON, DOLBY		67	4-919-698-01	INDICATOR	
56	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S		68	4-920-836-01	SHEET, INSULATING	
57	*4-919-653-01	SHEET (A), INDICATION		904	1-622-663-11	PC BOARD, SWITCH	
58	*4-919-656-01	BRACKET, HP		905	1-622-664-11	PC BOARD, JACK	
59	*4-920-831-01	REINFORCEMENT		906	*A-4375-317-A	(G-AEP).....	..MOUNTED PCB, CONTROL
60	7-685-646-79	SCREW +BTP 3X8 TYPE2 N-S			*A-4375-318-A	(Canadian.AEP.UK)...	..MOUNTED PCB, CONTROL
61	*4-919-657-01	HOUSE, SPECTRUM ANALYZER			*A-4375-328-A	(US).....	..MOUNTED PCB, CONTROL
62	4-919-662-01	HOUSE, VOLUME		907	1-622-662-11	PC BOARD, DUBBING	

SECTION 5

ELECTRICAL PARTS LIST

(4)



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
151	4-894-955-01	C SPRING		165	A-2100-381-A	(DECK B)...MD ASSY (TCM-YM47CW-26)	
152	3-390-823-01	WASHER, F			A-2100-382-A	(DECK A)...MD ASSY (TCM-YM47CW-27)	
153	7-621-905-65	SCREW, TOTSU P 2X8		HE301	1-543-261-11	(DECK B)...HEAD, ERASE (886-01-24)	
154	7-621-255-15	SCREW +P 2X3		HP301	1-543-424-11	(DECK A)...HEAD, MAGNETIC (PB)	
155	3-392-121-01	SCREW, STEP		HRP301	1-543-424-11	(DECK B)...HEAD, MAGNETIC (REC/PB)	
156	7-685-133-19	SCREW +P 2.6X6 TYPE1		M501	X-3390-801-1	(DECK A)...MOTOR ASSY	
157	3-390-805-01	ROLLER ASSY, PINCH		M502	X-3390-801-1	(DECK B)...MOTOR ASSY	
158	3-390-807-01	BELT		S401	1-570-716-11	(DECK A)...SWITCH, LEAF (FWD)	
159	3-390-816-01	BELT, SQUARE		S402	1-570-715-11	(DECK A)...SWITCH, LEAF (MOTOR B+)	
160	7-628-253-90	SCREW +PS 2.6X4		S403	1-571-216-11	(DECK A)...SWITCH, LEAF (TAPE SELECT)	
161	7-682-147-01	SCREW +PTT 3X6 (S)		S404	1-570-716-11	(DECK B)...SWITCH, LEAF (FWD)	
162	4-894-971-01	BUTTON LEVER		S405	1-571-260-11	(DECK B)...SWITCH, LEAF (REC)	
163	3-392-102-01	SCREW, D PAN		S406	1-570-715-11	(DECK B)...SWITCH, LEAF (MOTOR B+)	
164	7-685-781-04	SCREW +PTT 2X4 (S)		S407	1-571-216-11	(DECK B)...SWITCH, LEAF (TAPE SELECT)	

NOTE

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
 - If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

RESISTORS

COILS

SEMICONDUCTORS

SEMICONDUCTORS

in each case, $\delta : \mu$, for example:
 UA...: μA ..., UPA...: μPA ..., UPC...: μPC ,
 UPD...: μPD ...

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
901	*1-622-523-11	PC BOARD, POWER AMPLIFIER				
902	*A-4410-505-A	(Canadian,AEP,UK)...MOUNTED PCB, MAIN				
	*A-4410-515-A	(G-AEP).....MOUNTED PCB, MAIN				
	*A-4410-544-A	(US).....MOUNTED PCB, MAIN				
903	1-622-665-11	PC BOARD, SUB				
904	1-622-663-11	PC BOARD, SWITCH				
905	1-622-664-11	PC BOARD, JACK				
906	*A-4375-317-A	(G-AEP).....MOUNTED PCB, CONTROL				
	*A-4375-318-A	(Canadian,AEP,UK)....MOUNTED PCB, CONTROL				
	*A-4375-328-A	(US).....MOUNTED PCB, CONTROL				
907	1-622-662-11	PC BOARD, DUBBING				
908	*1-622-524-11	PC BOARD, FUSE				
909	1-533-162-00	HOLDER, FUSE				
910	*1-535-139-21	(US,Canadian)....BASE POST 22MM (10MM PITCH) 2P				
	*1-535-140-00	(AEP,G-AEP,UK)....BASE POST 22MM (10MM PITCH) 3P				
911	*1-535-139-00	(US,Canadian)....BASE POST 22MM (10MM PITCH) 3P				
912	1-535-416-00	(AEP,G-AEP,UK)....TERMINAL				
913	*1-535-116-00	TERMINAL				
914	Δ-1-558-942-11	(US,Canadian)...CORD, POWER				
	Δ-1-558-944-11	(AEP,G-AEP)....CORD, POWER				
	Δ-1-558-946-11	(UK).....CORD, POWER				
BU501	1-464-796-11	OSCILLATION UNIT, BIAS				
C101	1-123-875-91	ELECT	10MF	20%	50V	
C102	1-162-217-31	CERAMIC	56PF	5%	50V	
C103	1-136-163-00	FILM	0.068MF	5%	50V	
C104	1-124-902-00	ELECT	0.47MF	20%	50V	
C105	1-136-156-00	FILM	0.018MF	5%	50V	
C106	1-124-463-00	ELECT	0.1MF	20%	50V	
C107	1-102-126-00	CERAMIC	0.0056MF	10%	50V	
C108	1-136-162-00	FILM	0.056MF	5%	50V	
C109	1-102-118-00	CERAMIC	0.0012MF	10%	50V	
C110	1-136-155-00	FILM	0.015MF	5%	50V	
C111	1-162-290-31	CERAMIC	470PF	10%	50V	
C112	1-161-377-00	CERAMIC	0.0047MF	20%	16V	
C113	1-162-215-31	CERAMIC	47PF	5%	50V	
C114	1-162-284-31	CERAMIC	150PF	10%	50V	
C115	1-124-925-11	ELECT	2.2MF	20%	50V	
C116	1-124-443-00	ELECT	100MF	20%	10V	
C117	1-124-443-00	ELECT	100MF	20%	10V	
C122	1-124-257-00	ELECT	2.2MF	20%	50V	
C124	1-162-294-31	CERAMIC	0.001MF	10%	50V	

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C125	1-162-290-31	CERAMIC	470PF	10%	50V
C127	1-130-480-00	MYLAR	0.0056MF	5%	50V
C128	1-130-473-00	MYLAR	0.0015MF	5%	50V
C129	1-123-617-00	ELECT	10MF	20%	16V
C130	1-123-617-00	ELECT	10MF	20%	16V
C131	1-161-379-00	CERAMIC	0.01MF	30%	16V
C151	1-124-463-00	ELECT	0.1MF	20%	50V
C152	1-162-294-31	CERAMIC	0.001MF	10%	50V
C153	1-162-287-31	CERAMIC	270PF	10%	50V
C154	1-162-282-31	CERAMIC	100PF	10%	50V
C155	1-124-925-11	ELECT	2.2MF	20%	50V
C157	1-123-875-91	ELECT	10MF	20%	50V
C158	1-123-875-91	ELECT	10MF	20%	50V
C159	1-124-463-00	ELECT	0.1MF	20%	50V
C160	1-136-157-00	FILM	0.022MF	5%	50V
C161	1-123-875-91	ELECT	10MF	20%	50V
C162	1-136-158-00	FILM	0.027MF	5%	50V
C163	1-102-126-00	CERAMIC	0.0056MF	10%	50V
C164	1-123-875-91	ELECT	10MF	20%	50V
C165	1-136-154-00	FILM	0.012MF	5%	50V
C166	1-161-375-00	CERAMIC	0.0022MF	20%	16V
C167	1-123-875-91	ELECT	10MF	20%	50V
C168	1-102-122-00	CERAMIC	0.0027MF	10%	50V
C169	1-162-291-31	CERAMIC	560PF	10%	50V
C170	1-123-875-91	ELECT	10MF	20%	50V
C171	1-162-294-31	CERAMIC	0.001MF	10%	50V
C172	1-162-285-31	CERAMIC	180PF	10%	50V
C173	1-123-875-91	ELECT	10MF	20%	50V
C175	1-123-617-00	ELECT	10MF	20%	16V
C176	1-123-617-00	ELECT	10MF	20%	16V
C201	1-123-875-91	ELECT	10MF	20%	50V
C202	1-162-217-31	CERAMIC	56PF	5%	50V
C203	1-136-163-00	FILM	0.068MF	5%	50V
C204	1-124-902-00	ELECT	0.47MF	20%	50V
C205	1-136-156-00	FILM	0.018MF	5%	50V
C206	1-124-463-00	ELECT	0.1MF	20%	50V
C207	1-102-126-00	CERAMIC	0.0056MF	10%	50V
C208	1-136-162-00	FILM	0.056MF	5%	50V
C209	1-102-118-00	CERAMIC	0.0012MF	10%	50V
C210	1-136-155-00	FILM	0.015MF	5%	50V
C211	1-162-290-31	CERAMIC	470PF	10%	50V
C212	1-161-377-00	CERAMIC	0.0047MF	20%	16V
C213	1-162-215-31	CERAMIC	47PF	5%	50V
C214	1-162-284-31	CERAMIC	150PF	10%	50V
C215	1-124-925-11	ELECT	2.2MF	20%	50V
C222	1-124-257-00	ELECT	2.2MF	20%	50V

DXA-209W DXA-209W

ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS		
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C224	1-162-294-31	CERAMIC	0.001MF	10%	50V	C420	1-136-153-00	FILM	0.01MF	5%	50V
C225	1-162-290-31	CERAMIC	470PF	10%	50V	C421	1-130-479-00	MYLAR	0.0047MF	5%	50V
C227	1-130-480-00	MYLAR	0.0056MF	5%	50V	C422	1-123-617-00	ELECT	10MF	20%	16V
C228	1-130-473-00	MYLAR	0.0015MF	5%	50V	C423	1-123-902-00	ELECT	0.47MF	20%	50V
C229	1-123-617-00	ELECT	10MF	20%	16V	C424	1-136-153-00	FILM	0.01MF	5%	50V
C230	1-123-617-00	ELECT	10MF	20%	16V	C425	1-123-617-00	ELECT	10MF	20%	16V
C231	1-161-379-00	CERAMIC	0.01MF	30%	16V	C426	1-162-286-31	CERAMIC	220PF	10%	50V
C301	1-162-290-31	CERAMIC	470PF	10%	50V	C427	1-162-282-31	CERAMIC	100PF	10%	50V
C302	1-162-207-31	CERAMIC	22PF	5%	50V	C428	1-123-617-00	ELECT	10MF	20%	16V
C303	1-124-443-00	ELECT	100MF	20%	10V	C429	1-162-286-31	CERAMIC	220PF	10%	50V
C304	1-136-157-00	FILM	0.022MF	5%	50V	C430	1-162-286-31	CERAMIC	220PF	10%	50V
C305	1-136-157-00	FILM	0.022MF	5%	50V	C431	1-124-245-00	ELECT	4.7MF	20%	35V
C306	1-124-257-00	ELECT	2.2MF	20%	50V	C501	1-123-611-00	ELECT	1MF	20%	50V
C307	1-123-617-00	ELECT	10MF	20%	16V	C502	1-124-257-00	ELECT	2.2MF	20%	50V
C308	1-162-291-31	CERAMIC	560PF	10%	50V	C503	1-106-351-00	MYLAR	0.0022MF	10%	100V
C309	1-162-207-31	CERAMIC	22PF	5%	50V	C504	1-106-351-00	MYLAR	0.0022MF	10%	100V
C310	1-124-443-00	ELECT	100MF	20%	10V	C505	1-124-245-00	ELECT	4.7MF	20%	35V
C311	1-136-157-00	FILM	0.022MF	5%	50V	C506	1-123-617-00	ELECT	10MF	20%	16V
C312	1-136-157-00	FILM	0.022MF	5%	50V	C507	1-123-617-00	ELECT	10MF	20%	16V
C313	1-124-257-00	ELECT	2.2MF	20%	50V	C508	1-161-379-00	CERAMIC	0.01MF	30%	16V
C314	1-131-346-00	TANTALUM	0.68MF	10%	35V	C509	1-161-379-00	CERAMIC	0.01MF	30%	16V
C315	1-123-617-00	ELECT	10MF	20%	16V	C510	1-161-379-00	CERAMIC	0.01MF	30%	16V
C316	1-123-611-00	ELECT	1MF	20%	50V	C511	1-161-379-00	CERAMIC	0.01MF	30%	16V
C317	1-124-443-00	ELECT	100MF	20%	10V	C512	1-161-379-00	CERAMIC	0.01MF	30%	16V
C318	1-136-165-00	FILM	0.1MF	5%	50V	C513	1-161-379-00	CERAMIC	0.01MF	30%	16V
C319	1-136-153-00	FILM	0.01MF	5%	50V	C514	1-161-379-00	CERAMIC	0.01MF	30%	16V
C320	1-136-153-00	FILM	0.01MF	5%	50V	C515	1-161-379-00	CERAMIC	0.01MF	30%	16V
C321	1-130-479-00	MYLAR	0.0047MF	5%	50V	C516	1-123-617-00	ELECT	10MF	20%	16V
C322	1-123-617-00	ELECT	10MF	20%	16V	C517	1-124-482-11	ELECT	33MF	20%	35V
C323	1-123-902-00	ELECT	0.47MF	20%	50V	C518	1-123-617-00	ELECT	10MF	20%	16V
C324	1-136-153-00	FILM	0.01MF	5%	50V	C519	1-123-617-00	ELECT	10MF	20%	16V
C325	1-123-617-00	ELECT	10MF	20%	16V	C520	1-161-379-00	CERAMIC	0.01MF	30%	16V
C326	1-162-286-31	CERAMIC	220PF	10%	50V	C551	1-123-617-00	ELECT	10MF	20%	16V
C327	1-162-282-31	CERAMIC	100PF	10%	50V	C552	1-123-617-00	ELECT	10MF	20%	16V
C328	1-123-617-00	ELECT	10MF	20%	16V	C701	1-124-925-11	ELECT	2.2MF	20%	50V
C329	1-162-286-31	CERAMIC	220PF	10%	50V	C702	1-162-288-31	CERAMIC	330PF	10%	50V
C330	1-162-286-31	CERAMIC	220PF	10%	50V	C703	1-162-290-31	CERAMIC	470PF	10%	50V
C331	1-124-245-00	ELECT	4.7MF	20%	35V	C704	1-124-477-11	ELECT	47MF	20%	25V
C364	1-123-617-00	ELECT	10MF	20%	16V	C705	1-124-910-11	ELECT	47MF	20%	50V
C401	1-162-290-31	CERAMIC	470PF	10%	50V	C706	1-136-165-00	FILM	0.1MF	5%	50V
C402	1-162-207-31	CERAMIC	22PF	5%	50V	C707	1-123-875-91	ELECT	10MF	20%	50V
C403	1-124-443-00	ELECT	100MF	20%	10V	C708	1-124-443-00	ELECT	100MF	20%	10V
C404	1-136-157-00	FILM	0.022MF	5%	50V	C709	1-136-165-00	(EXCEPT FOR G-AEP)...FILM	0.1MF	5%	50
C405	1-136-157-00	FILM	0.022MF	5%	50V	C710	1-124-122-11	ELECT	100MF	20%	50V
C406	1-124-257-00	ELECT	2.2MF	20%	50V	C712	1-124-477-11	ELECT	47MF	20%	25V
C407	1-123-617-00	ELECT	10MF	20%	16V	C714	1-136-165-00	(G-AEP)...FILM	0.1MF	5%	50V
C408	1-162-291-31	CERAMIC	560PF	10%	50V	C716	1-124-482-11	ELECT	33MF	20%	35V
C409	1-162-207-31	CERAMIC	22PF	5%	50V	C751	1-124-925-11	ELECT	2.2MF	20%	50V
C410	1-124-443-00	ELECT	100MF	20%	10V	C752	1-162-217-31	CERAMIC	56PF	5%	50V
C411	1-136-157-00	FILM	0.022MF	5%	50V	C753	1-162-282-31	CERAMIC	100PF	10%	50V
C412	1-136-157-00	FILM	0.022MF	5%	50V	C756	1-124-925-11	ELECT	2.2MF	20%	50V
C413	1-124-257-00	ELECT	2.2MF	20%	50V	C758	1-124-657-00	ELECT	10MF	20%	50V
C414	1-131-346-00	TANTALUM	0.68MF	10%	35V	C759	1-124-463-00	ELECT	0.1MF	20%	50V
C415	1-123-617-00	ELECT	10MF	20%	16V	C770	1-124-463-00	ELECT	0.1MF	20%	50V
C416	1-123-611-00	ELECT	1MF	20%	50V	C801	1-124-925-11	ELECT	2.2MF	20%	50V
C417	1-124-443-00	ELECT	100MF	20%	10V	C802	1-162-288-31	CERAMIC	330PF	10%	50V
C418	1-136-165-00	FILM	0.1MF	5%	50V	C803	1-162-290-31	CERAMIC	470PF	10%	50V
C419	1-136-153-00	FILM	0.01MF	5%	50V	C804	1-124-477-11	ELECT	47MF	20%	25V
The components identified by shading and mark  are critical for safety. Replace only with part number specified.											

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D954	8-719-911-19	DIODE 1SS119
D955	8-719-911-19	DIODE 1SS119
F001	A-1-532-783-21	(US,Canadian)...FUSE, MICRO (SECONDARY)
F002	A-1-532-783-21	(US)...FUSE, MICRO (SECONDARY)
F901	A-1-532-078-00	(AEP,G-AEP,UK)...FUSE, TIME-LAG
F901	A-1-532-744-11	(US,Canadian)...FUSE, GLASS TUBE
HE301	1-543-261-11	(DECK B)...HEAD, ERASE (886-01-24)
HP301	1-543-424-11	(DECK A)...HEAD, MAGNETIC (PB)
HRP301	1-543-424-11	(DECK B)...HEAD, MAGNETIC (REC/PB)
IC101	8-759-600-02	IC M5218L
IC102	8-759-602-04	IC M5226P
IC103	8-759-600-02	IC M5218L
IC151	8-759-600-02	IC M5218L
IC161	8-759-917-42	IC IR2E31A
IC162	8-759-917-42	IC IR2E31A
IC163	8-759-917-42	IC IR2E31A
IC164	8-759-917-42	IC IR2E31A
IC165	8-759-917-42	IC IR2E31A
IC202	8-759-602-04	IC M5226P
IC301	8-759-106-61	IC UPC4570HA
IC302	8-759-106-61	IC UPC4570HA
IC303	8-752-031-83	IC CXA1101P
IC304	8-759-601-43	IC M4066BP
IC401	8-759-600-02	IC M5218L
IC501	8-759-112-88	IC UPD65005C-112
IC701A	8-749-900-96	IC STK4142MK2
IC751	8-759-106-61	IC UPC4570HA
IC901A	8-759-604-84	IC M5F7806
IC902A	8-759-604-85	IC M5F7906
J101	1-507-974-11	JACK (MIC)
J102	1-507-908-11	JACK, PIN 4P (PHONO/CD)
J701	1-563-951-11	JACK (PHONES)
L301	1-410-774-11	MICRO INDUCTOR 8.2MMH
L302	1-410-772-11	MICRO INDUCTOR 5.6MMH
L303	1-410-779-21	MICRO INDUCTOR 22MMH
L401	1-410-774-11	MICRO INDUCTOR 8.2MMH
L402	1-410-772-11	MICRO INDUCTOR 5.6MMH
L403	1-410-779-21	MICRO INDUCTOR 22MMH
L501	1-408-088-00	MICRO INDUCTOR 22UH
L901	1-408-117-00	MICRO INDUCTOR 10UH
L902	1-408-117-00	MICRO INDUCTOR 10UH
M501	X-3390-801-1	(DECK A)...MOTOR ASSY
M502	X-3390-801-1	(DECK B)...MOTOR ASSY
Q301	8-729-806-28	TRANSISTOR 2SC3402
Q302	8-729-806-28	TRANSISTOR 2SC3402
Q303	8-729-806-28	TRANSISTOR 2SC3402
Q304	8-729-806-28	TRANSISTOR 2SC3402
Q305	8-729-806-28	TRANSISTOR 2SC3402
Q306	8-729-806-28	TRANSISTOR 2SC3402
Q307	8-729-806-28	TRANSISTOR 2SC3402
Q308	8-729-806-28	TRANSISTOR 2SC3402
Q310	8-729-600-27	TRANSISTOR 2SC634SP
Q311	8-729-806-28	TRANSISTOR 2SC3402
Q401	8-729-806-28	TRANSISTOR 2SC3402
Q402	8-729-806-28	TRANSISTOR 2SC3402

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q403	8-729-806-28	TRANSISTOR 2SC3402
Q404	8-729-806-28	TRANSISTOR 2SC3402
Q405	8-729-806-28	TRANSISTOR 2SC3402
Q406	8-729-806-28	TRANSISTOR 2SC3402
Q407	8-729-806-28	TRANSISTOR 2SC3402
Q408	8-729-806-28	TRANSISTOR 2SC3402
Q410	8-729-600-27	TRANSISTOR 2SC634SP
Q411	8-729-806-28	TRANSISTOR 2SC3402
Q501	8-729-102-03	TRANSISTOR 2SD1020
Q502	8-729-806-28	TRANSISTOR 2SC3402
Q503	8-729-806-28	TRANSISTOR 2SC3402
Q504	8-729-806-28	TRANSISTOR 2SC3402
Q505	8-729-600-27	TRANSISTOR 2SC634SP
Q506	8-729-600-27	TRANSISTOR 2SC634SP
Q507	8-729-806-28	TRANSISTOR 2SC3402
Q508	8-729-806-28	TRANSISTOR 2SC3402
Q509	8-729-806-28	TRANSISTOR 2SC3402
Q510	8-729-806-28	TRANSISTOR 2SC3402
Q511	8-729-806-28	TRANSISTOR 2SC3402
Q513	8-729-117-43	TRANSISTOR 2SD774
Q514	8-729-117-43	TRANSISTOR 2SD774
Q515	8-729-117-54	TRANSISTOR 2SA1175
Q516	8-729-117-54	TRANSISTOR 2SA1175
Q517	8-729-806-28	TRANSISTOR 2SC3402
Q518	8-729-806-28	TRANSISTOR 2SC3402
Q551	8-729-600-27	TRANSISTOR 2SC634SP
Q552	8-729-600-27	TRANSISTOR 2SC634SP
Q553	8-729-806-28	TRANSISTOR 2SC3402
Q554	8-729-117-54	TRANSISTOR 2SA1175
Q701	8-729-600-27	TRANSISTOR 2SC634SP
Q702	8-729-117-54	TRANSISTOR 2SA1175
Q703	8-729-117-54	TRANSISTOR 2SA1175
Q751	8-729-600-27	TRANSISTOR 2SC634SP
Q801	8-729-600-27	TRANSISTOR 2SC634SP
Q802	8-729-117-54	TRANSISTOR 2SA1175
Q851	8-729-600-27	TRANSISTOR 2SC634SP
Q901	8-729-107-25	TRANSISTOR 2SD1585-L
R101	1-249-425-11	CARBON 4.7K 5% 1/6W
R102	1-249-433-11	CARBON 22K 5% 1/6W
R103	1-249-438-11	CARBON 56K 5% 1/6W
R203	1-249-438-11	CARBON 56K 5% 1/6W
R204	1-249-438-11	CARBON 56K 5% 1/6W
R205	1-249-425-11	CARBON 4.7K 5% 1/6W
R206	1-249-428-11	CARBON 8.2K 5% 1/6W
R207	1-249-417-11	CARBON 1K 5% 1/6W
R210	1-249-439-11	CARBON 68K 5% 1/6W
R221	1-249-441-11	CARBON 100K 5% 1/6W
R222	1-249-417-11	CARBON 1K 5% 1/6W
R223	1-247-891-00	CARBON 330K 5% 1/6W
R224	1-247-855-00	CARBON 10K 5% 1/6W
R225	1-249-438-11	CARBON 56K 5% 1/6W
R227	1-215-487-00	CARBON 560K 5% 1/6W
R228	1-249-437-11	CARBON 47K 5% 1/6W
R229	1-249-423-11	CARBON 3.3K 5% 1/6W
R230	1-249-437-11	CARBON 47K 5% 1/6W
R231	1-249-419-11	CARBON 1.5K 5% 1/6W
R276	1-249-434-11	CARBON 27K 5% 1/6W
R301	1-247-883-00	CARBON 150K 5% 1/6W
R303	1-247-887-00	CARBON 220K 5% 1/6W
R304	1-247-849-00	CARBON 5.6K 5% 1/6W
R305	1-249-422-11	CARBON 2.7K 5% 1/6W
R306	1-249-421-11	CARBON 2.2K 5% 1/6W
R307	1-247-855-00	CARBON 10K 5% 1/6W
R308	1-247-883-00	CARBON 150K 5% 1/6W
R309	1-247-883-00	CARBON 150K 5% 1/6W
R310	1-247-887-00	CARBON 220K 5% 1/6W
R311	1-247-849-00	CARBON 5.6K 5% 1/6W
R312	1-249-422-11	CARBON 2.7K 5% 1/6W
R313	1-249-421-11	CARBON 2.2K 5% 1/6W
R314	1-247-855-00	CARBON 10K 5% 1/6W
R316	1-249-405-11	CARBON 100K 5% 1/6W
R317	1-247-849-00	CARBON 5.6K 5% 1/6W
R318	1-249-417-11	CARBON 1K 5% 1/6W
R319	1-247-887-00	CARBON 220K 5% 1/6W
R320	1-247-887-00	CARBON 220K 5% 1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description
R152	1-249-417-11	CARBON 1K 5% 1/6W
R153	1-247-855-00	CARBON 10K 5% 1/6W
R154	1-249-417-11	CARBON 1K 5% 1/6W
R155	1-249-439-11	CARBON 68K 5% 1/6W
R156	1-215-460-00	CARBON 43K 5% 1/6W
R157	1-247-855-00	CARBON 10K 5% 1/6W
R158	1-249-441-11	CARBON 100K 5% 1/6W
R160	1-247-855-00	CARBON 10K 5% 1/6W
R161	1-249-441-11	CARBON 100K 5% 1/6W
R163	1-247-855-00	CARBON 10K 5% 1/6W
R164	1-249-441-11	CARBON 100K 5% 1/6W
R166	1-247-855-00	CARBON 10K 5% 1/6W
R167	1-249-441-11	CARBON 100K 5% 1/6W
R169	1-247-855-00	CARBON 10K 5% 1/6W
R170	1-249-441-11	CARBON 100K 5% 1/6W
R172	1-249-410-11	CARBON 270 5% 1/6W
R173	1-249-410-11	CARBON 270 5% 1/6W
R174	1-247-855-00	CARBON 10K 5% 1/6W
R176	1-249-434-11	CARBON 27K

ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS			ELECTRICAL PARTS			
Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	
R339	1-247-859-00	CARBON	15K	5%	1/6W	R702	1-249-438-11	CARBON	56K	5%	1/6W	
R502	1-249-416-11	CARBON	820	5%	1/6W	R703	1-249-416-11	CARBON	820	5%	1/6W	
R504	1-249-419-11	CARBON	1.5K	5%	1/6W	R704	1-249-438-11	CARBON	56K	5%	1/6W	
R505	1-249-425-11	CARBON	4.7K	5%	1/6W	R705	▲1-247-752-11	CARBON	1K	5%	1/2W F	
R506	1-247-855-00	CARBON	10K	5%	1/6W	R706	▲1-212-881-00	FUSIBLE	100	5%	1/4W F	
R507	1-249-441-11	CARBON	100K	5%	1/6W	R707	▲1-247-752-11	CARBON	1K	5%	1/2W F	
R508	1-249-437-11	CARBON	47K	5%	1/6W	R708	▲1-247-752-11	CARBON	1K	5%	1/2W F	
R509	1-247-855-00	CARBON	10K	5%	1/6W	R709	1-249-425-11	CARBON	4.7K	5%	1/6W	
R510	1-247-855-00	CARBON	10K	5%	1/6W	R710	1-249-409-11	CARBON	220	5%	1/6W	
R511	1-249-437-11	CARBON	47K	5%	1/6W	R711	1-249-425-11	CARBON	4.7K	5%	1/6W	
R513	1-247-855-00	CARBON	10K	5%	1/6W	R712	1-249-425-11	CARBON	4.7K	5%	1/6W	
R514	1-249-427-11	CARBON	6.8K	5%	1/6W	R713	1-247-887-00	CARBON	220K	5%	1/6W	
R515	1-249-437-11	CARBON	47K	5%	1/6W	R714	▲1-212-958-00	FUSIBLE	10	5%	1/2W F	
R517	1-249-421-11	CARBON	2.2K	5%	1/6W	R715	1-247-855-00	CARBON	10K	5%	1/6W	
R518	1-249-414-11	CARBON	560	5%	1/6W	R716	1-247-855-00	CARBON	10K	5%	1/6W	
R519	1-249-414-11	CARBON	560	5%	1/6W	R717	1-249-421-11	CARBON	2.2K	5%	1/6W	
R520	1-249-414-11	CARBON	560	5%	1/6W	R718	1-249-419-11	CARBON	1.5K	5%	1/6W	
R521	1-249-417-11	CARBON	1K	5%	1/6W	R719	1-212-958-00	(G-AEP)...	FUSIBLE	10	5%	1/2W F
R522	1-249-421-11	CARBON	2.2K	5%	1/6W	R723	1-247-747-11	CARBON	470	5%	1/2W	
R523	1-249-421-11	CARBON	2.2K	5%	1/6W	R730	▲1-212-958-00	FUSIBLE	10	5%	1/2W F	
R524	1-249-425-11	CARBON	4.7K	5%	1/6W	R751	1-249-417-11	CARBON	1K	5%	1/6W	
R525	1-249-441-11	CARBON	100K	5%	1/6W	R752	1-249-438-11	CARBON	56K	5%	1/6W	
R526	1-249-441-11	CARBON	100K	5%	1/6W	R753	1-247-855-00	CARBON	10K	5%	1/6W	
R527	1-249-433-11	CARBON	22K	5%	1/6W	R754	1-249-434-11	CARBON	27K	5%	1/6W	
R528	1-249-433-11	CARBON	22K	5%	1/6W	R756	1-249-441-11	CARBON	100K	5%	1/6W	
R529	1-249-433-11	CARBON	22K	5%	1/6W	R758	1-247-895-00	CARBON	470K	5%	1/6W	
R530	1-249-408-11	CARBON	180	5%	1/6W	R759	1-249-428-11	CARBON	8.2K	5%	1/6W	
R531	1-249-408-11	CARBON	180	5%	1/6W	R760	1-249-414-11	CARBON	560	5%	1/6W	
R532	1-249-420-11	CARBON	1.8K	5%	1/6W	R761	1-249-441-11	CARBON	100K	5%	1/6W	
R533	1-249-420-11	CARBON	1.8K	5%	1/6W	R762	1-247-855-00	CARBON	10K	5%	1/6W	
R535	1-249-405-11	CARBON	100	5%	1/6W	R763	1-215-493-00	CARBON	1M	5%	1/6W	
R536	1-249-405-11	CARBON	100	5%	1/6W	R764	1-247-855-00	CARBON	10K	5%	1/6W	
R537	1-247-855-00	CARBON	10K	5%	1/6W	R770	1-249-423-11	CARBON	3.3K	5%	1/6W	
R538	1-249-425-11	CARBON	4.7K	5%	1/6W	R801	1-249-421-11	CARBON	2.2K	5%	1/6W	
R539	1-249-425-11	CARBON	4.7K	5%	1/6W	R802	1-249-438-11	CARBON	56K	5%	1/6W	
R540	1-249-417-11	CARBON	1K	5%	1/6W	R803	1-249-416-11	CARBON	820	5%	1/6W	
R541	1-249-417-11	CARBON	1K	5%	1/6W	R804	1-249-438-11	CARBON	56K	5%	1/6W	
R542	1-249-441-11	CARBON	100K	5%	1/6W	R805	▲1-247-752-11	CARBON	1K	5%	1/2W F	
R550	1-215-460-00	CARBON	43K	5%	1/6W	R813	1-247-747-11	CARBON	470	5%	1/2W	
R551	1-249-414-11	CARBON	560	5%	1/6W	R814	▲1-212-958-00	FUSIBLE	10	5%	1/2W F	
R552	1-249-437-11	CARBON	47K	5%	1/6W	R815	1-247-855-00	CARBON	10K	5%	1/6W	
R553	1-249-425-11	CARBON	4.7K	5%	1/6W	R817	1-249-421-11	CARBON	2.2K	5%	1/6W	
R554	1-249-417-11	CARBON	1K	5%	1/6W	R818	1-249-419-11	CARBON	1.5K	5%	1/6W	
R555	1-202-471-00	SOLID	4.7M	5%	1/4W	R819	1-212-958-00	(G-AEP)...	FUSIBLE	10	5%	1/2W
R701	1-249-421-11	CARBON	2.2K	5%	1/6W	R851	1-249-417-11	CARBON	1K	5%	1/6W	

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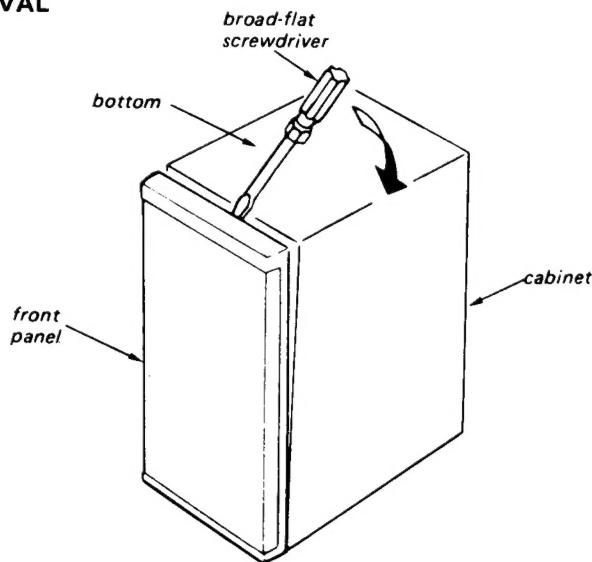
The components identified by shading and mark **▲** are critical for safety. Replace only with part number specified.

FH-209W
FH-203
FH-205W

SPEAKER SYSTEM [APM-209]

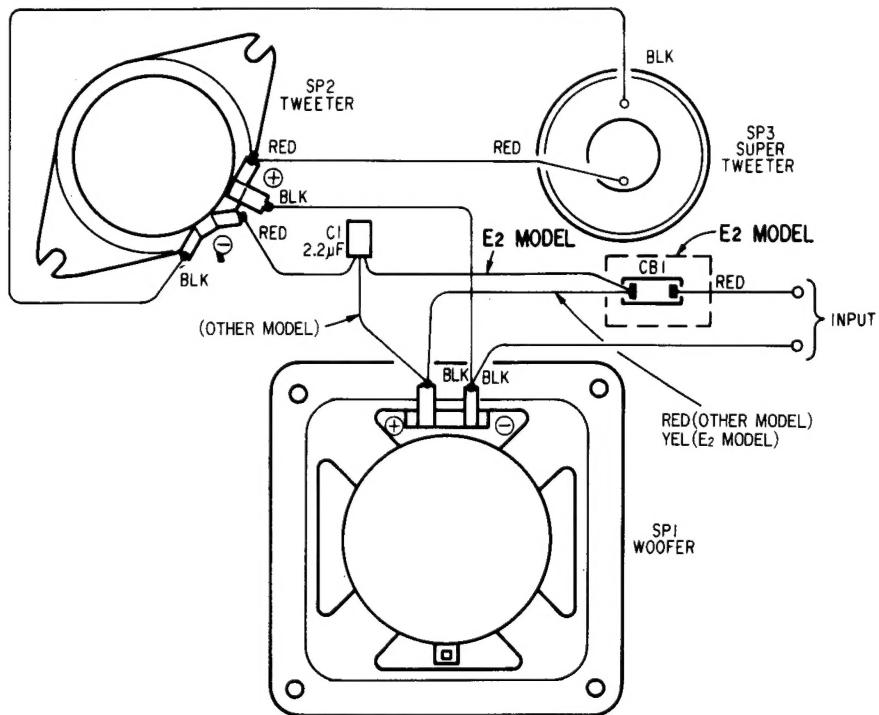
*US Model
Canadian Model
AEP Model
UK Model
E Model*

1. DISASSEMBLY FRONT PANEL REMOVAL

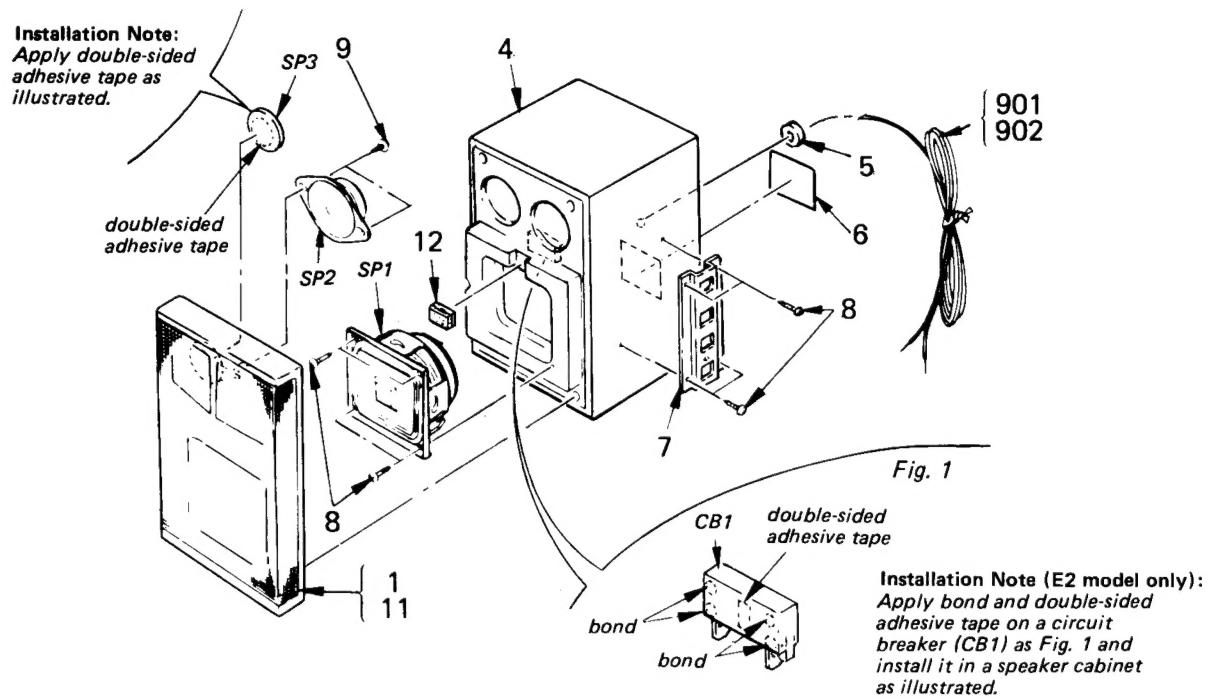


Note: Be careful not to scratch the cabinet.

2. WIRING DIAGRAM



3. EXPLODED VIEW AND PARTS LIST



ELECTRICAL PARTS

No.	Part No.	Description	Remarks	Ref.No.	Part No.	Description
1	X-4919-607-1	(US,Canadian,AEP,UK)PANEL(LEFT) ASSY, FRONT		901	1-559-268-11	(Canadian,AEP,UK,E3,Saudi Arabia)CORD, SPEAKER (A)
	X-4919-609-1	(E2,E3,Saudi Arabia)PANEL(LEFT) ASSY, FRONT			1-559-269-11	(E2).....CORD, SPEAKER (B)
					1-559-443-11	(US).....CORD, SPEAKER (D)
4	X-4910-302-1	(US,Canadian,AEP,UK,E2,E3,Saudi Arabia) ...CABINET ASSY, SPEAKER		902	1-559-270-11	(E2)...CORD, SPEAKER (C) (YEL)
	X-4910-307-1	(G-AEP).....CABINET ASSY, SPEAKER		C1	1-123-544-00	ELECT 2.2MF 20% 50V
				CB1	1-532-661-00	CIRCUIT BREAKER (1.6A)
5	4-870-003-00	CLIPPER, CORD		SP1	1-503-807-11	(US,Canadian,AEP,UK)...SPEAKER
6	4-919-679-01	(AEP,UK).....LABEL, MODEL NUMBER		SP1	1-503-808-11	(E2,E3,Saudi Arabia)...SPEAKER
	4-919-680-01	(E2).....LABEL, MODEL NUMBER		SP2	1-503-795-11	SPEAKER, CONE (5CM)
	4-919-681-01	(E3,Saudi,Arabia)...LABEL, MODEL NUMBER		SP3	1-529-053-11	BUZZER
	4-920-850-01	(US,Canadian).....LABEL, MODEL NUMBER				
7	4-920-144-01	PLATE (B), SIDE				
8	4-874-614-11	SCREW (4) (3.5X14), TAPPING				
9	7-685-646-79	SCREW +BVTP 3X8 TYPE2 SLIT				
11	X-4919-608-1	(US,Canadian,AEP,UK)PANEL (RIGHT) ASSY, FRONT				ACCESSORY & PACKING MATERIAL
	X-4919-610-1	(E2,E3,Saudi Arabia)PANEL (RIGHT) ASSY, FRONT			3-701-690-00	(UK)...LABEL (MADE IN JAPAN)
					3-769-112-11	(UK)...MANUAL, INSTRUCTION
					4-920-121-01	(UK)...CUSHION
					4-920-158-01	(UK)...INDIVIDUAL CARTON
					4-920-151-01	(UK)...SHEET, PROTECTION
12	*4-920-140-01	PACKING				

ACCESSORY & PACKING MATERIAL

3-701-690-00 (UK)...LABEL (MADE IN JAPAN)
3-769-112-11 (UK)...MANUAL, INSTRUCTION
4-920-121-01 (UK)...CUSHION
4-920-158-01 (UK)...INDIVIDUAL CARTON
4-920-151-01 (UK)...SHEET, PROTECTION